Academic Practice

Digitizing, Relating, Existing

Proefschrift aangeboden tot het verkrijgen van graad van Doctor in de Pedagogische Wetenschappen

Mathias Decuypere
Promotor: Prof. Dr. Maarten Simons

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Faire sans savoir complètement ce que l'on fait, c'est se donner une chance de découvrir dans ce que l'on a fait quelque chose que l'on ne savait pas.

Pierre Bourdieu

Abstract

The current condition of the university is subject of profound debate. Over the last years, it has become clear that the university is facing important challenges on the one hand, and increasing societal demands on the other hand. The main research interest of this dissertation is to come to a more profound understanding of the university today, with a special focus on what the role of digital actors is herein, but without placing emphasis on such (contextualizing) evolutions. Rather than that, the university is approached through concrete daily academic practices in which both social (academics, students, …) and material (computers, paper, …) actors are situated.

In order to investigate the university likewise, this dissertation adopts a research approach that is largely inspired by two theoretical vantage points: a sociomaterial and a sociotopological approach. The combination of these approaches will enable to analyze academic practices through the relations between actors present in these practices, instead of solely focusing on (the experiences or interpretations of) these actors as such.

In this sociomaterial and sociotopological vein, four empirical studies were conducted. The first two studies are focusing on the composition of academic practices by interviewing professors about their previous working day. Based on these interviews, this composition was scrutinized by deploying network visualizations as a central means of analysis and that present how (and which) multifarious actors are related to each other, in order for academic practice to be able to function. These networks, which bridge qualitative and quantitative methods, constitute the focal points of analysis in order to come to an understanding of academic practices, and this by analyzing the relations between social, material and digital actors present in these practices. These studies concretely present how academic practice is constituted nowadays (consisting of a broad network of heterogeneous actors and the relations that are established between these actors); how it is distributed (how academic practice crystalizes into different regions of activities); and finally how it is associated (how different regions relate to each other). Furthermore, three profiles are discerned that present typical academic forms, presented in the form of an atlas.

The two other studies originate from an ethnographic research stay conducted at two research centers. One study specifically focuses on the role of the digital in contemporary academic practices, and more particularly on the prototypical device that is associated with the digital, that is, the screen. This study analyzes the operations performed by the screen, and more particularly, what comes to the fore when analyzing the screen as an active actor rather than as a merely transmitting or displaying medium. In doing so, this study makes clear how academic practice is shaped through the screen; what needs to be put in place in order for this screen to be able to operate; the different roles that screens perform; and finally how the screen might be in tune, or rather precisely out of sync, with the human actors present in different practices.

The fourth and last study poses the question as to whether there is something specific about what we often unreflexively denote as 'academic'. In order to come to an answer to this question, we adopt the notion of 'mode of existence' and scrutinize whether or not there are typical ways to exist *as* an academic. The notion of 'existing' is more particularly tied to the notion of 'attachment'. That is, in this last study we assert that what it means to exist as an academic can be investigated by scrutinizing what academics are precisely attached to. On the basis of four different types of attachments, we argue that the typical way of existing as an academic nowadays consists of what we designate as 'distancing in action', i.e. a continuous mobilizing of what is not present and a continuous search for slowing things down.

Samenvatting

Over de huidige conditie van de universiteit wordt grondig gedebatteerd. De laatste jaren is duidelijk geworden dat de universiteit enerzijds voor belangrijke uitdagingen staat, en anderzijds dat ze ook steeds meer dient te voldoen aan maatschappelijke verwachtingen. De algemene onderzoeksinteresse van dit proefschrift is te komen tot een meer diepgaand inzicht in de universiteit vandaag de dag, met speciale aandacht voor wat de rol van digitale actoren hierin is, en dit zonder de klemtoon te leggen op bovenstaande evoluties. In plaats daarvan wordt de universiteit benaderd vanuit concrete dagelijkse academische praktijken, waarin zowel sociale (academici, studenten, …) als materiële (computers, papier, …) actoren gesitueerd zijn.

Om de universiteit op deze manier te onderzoeken, doet dit proefschrift beroep op twee theoretische benaderingen: een sociomateriële benadering en een sociotopologische. Beide benaderingen hebben een relationeel vertrekpunt, die empirische analyzes uitvoeren die vertrekken vanuit de relaties tussen actoren, in plaats vanuit (de ervaringen of de interpretaties van) deze actoren als zodanig.

Om de academische praktijk op deze manier te onderzoeken, werden vier empirische studies uitgevoerd. De eerste twee studies focussen op de compositie van academisch werk door middel van interviews met professoren omtrent hun vorige werkdag. Op basis van deze interviews werd deze compositie onderzocht door gebruik te maken van netwerkvisualisaties als centraal analysemiddel. Dergelijke visualisaties presenteren hoe (en welke) veelsoortige actoren gerelateerd zijn met elkaar, opdat de academische praktijk zou kunnen functioneren. Deze netwerken, die kwalitatieve en kwantitatieve methodes samenbrengen, zijn de focale punten van analyse om tot een begrip van academische praktijken te kunnen komen, en dit door de relaties tussen sociale, materiële en digitale actoren te analyseren. Deze twee studies presenteren concreet hoe de academische praktijk geconstitueerd is (bestaand uit een breed netwerk van heterogene actoren, en de relaties tussen deze actoren); hoe zij gedistribueerd is (hoe academische praktijk kristalliseert in verschillende regio's van activiteiten); en ten slotte hoe zij geassocieerd is (hoe verschillende regio's met elkaar relateren). Verder worden drie profielen onderscheiden die typische academisch vormen presenteren, en dit gepresenteerd als een atlas.

De laatste twee studies komen voort uit een etnografisch onderzoek uitgevoerd aan twee onderzoekscentra. Eén studie focust daarbij op de rol van het digitale in huidige academische praktijken, en meer bepaald op het prototypische instrument dat met dit digitale geassocieerd is: het scherm. Deze studie analyseert de operaties die uitgevoerd worden door het scherm, en meer in het bijzonder wat naar voor komt wanneer het scherm geanalyseerd wordt als een actieve actor (in plaats van als een neutraal medium dat slechts enkel zou tonen wat de gebruiker het scherm opdraagt te tonen). De studie maakt duidelijk hoe de academische praktijk gevormd wordt doorheen het scherm; wat zoal in plaats gesteld moet worden opdat dit scherm zou kunnen werken; de verschillende rollen die het scherm speelt; en ten slotte hoe het scherm op sommige momenten in overeenstemming is met andere (menselijke) actoren, en op andere momenten precies niet.

De vierde en laatste studie stelt de vraag of er iets specifiek is aan dat wat we vaak eerder onreflexief 'academisch' noemen. Om deze vraag te kunnen beantwoorden, maken we gebruik van de notie 'mode of existence' (bestaanswijze), en onderzoeken of er typische manieren zijn om te bestaan *als* een academicus/-a. De notie 'bestaan' wordt hier gekoppeld aan de notie 'attachment' (gehechtheid). Op basis van vier verschillende types van attachments, stellen we dat de typische manier om als een academicus/-a te bestaan vandaag de dag bestaat uit wat we 'distantiëren in actie' noemen, dit wil zeggen: een continu mobiliseren van wat niet aanwezig is en een continu zoeken om de dagelijkse gang van zaken te vertragen.

Woord(en) van dank

En plots valt het doek.

Ineens, zo uit het niets, is het daar: het einde. Het laatste punt dat je zet. De streep die je eronder trekt. In deze context misschien extra gepast: het scherm dat je dichtklapt. Er zou opgemerkt kunnen worden hoe bizar het is dat dit einde, dat zich zo treffend manifesteert in de vorm van een dankwoord, vaak in het begin van een proefschrift wordt geplaatst. Is dat niet de wereld op zijn kop? Alles welbeschouwd, misschien toch ook weer niet. Beginnen met het einde is in zekere zin ook de cirkel rondmaken.

Om die cirkel rond te maken, dan maar even, in dit begin van dit proefschrift, naar het begin van het traject dat geleid heeft tot deze tekst. Wanneer, en waar, is dit onderzoek ooit begonnen? Op de dag dat ik mijn krabbel op een of ander papiertje plaatste? Dat lijkt me een nogal economische kijk op de zaken, maar vooral ook, niet juist. Op de dag dat ik voor het eerst in de gang van het ECS stapte? Bijna, maar ook weer niet. Op het moment dat ik begon te studeren? Dat lijkt me er dan weer ver naast. De vraag naar het wanneer of het waar is in die zin misschien een foute voorstelling van hoe men verwacht dat een onderzoek zijn aanvang neemt. De juiste vraag is veeleer: met wie? Die vraag is misschien verrassend in een context waar onderzoek vaak geassocieerd wordt met afstandelijkheid en objectiviteit, maar in dit geval is ze precies juist. Maarten, ik zou niet weten hoe ik je hier gepast kan bedanken. Harry Mulisch zei ooit dat als je een knoop hebt, je dan maar een jas moet maken. Ik wil hier geenszins een metaforisch schouwspel tentoon spreiden, maar toch. Bedankt om me steeds weer nieuwe knopen aan te reiken. Bedankt om te zien dat de jas soms drie mouwen, of plots twee broekspijpen had. Om stof en knoop soms uit elkaar te trekken, maar vooral ook aaneen te rijgen. Bedankt om het beste in me naar boven te halen. Om dingen te lezen of te zien waar ik het bestaan zelfs niet van vermoedde. Om nooit deadlines te stellen, maar steeds alles op te volgen. Om nooit te zeggen dat, maar altijd te vragen hoe. Om me nooit aan de ketting te houden, maar steeds voor de leeuwen te gooien. Om dit alles nooit te beperken tot gewoonweg begeleiden, maar steeds betrokken

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Iedereen die heeft meegewerkt aan dit onderzoek, omdat het verdraaid moeilijk moet zijn de rollen plots om te draaien. Bedankt.

Om helemaal af te sluiten – het begin van dit proefschrift voor de lezer, het einde van een gans traject voor deze schrijver: velen die mij zijn voorgegaan, (be)schrijven hier, op zijn minst tussen de regels door, de last die van hun schouders gevallen is. Dat is bij ondergetekende niet echt het geval. Integendeel. Ik heb de tijd van mijn leven gehad.

De dagen waren soms erg lang, maar de jaren vlogen voorbij.

Mathias
Maart 2015

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GENERAL INTRODUCTION

The professional life of academics is increasingly shaped through digital technologies nowadays, which are deployed in activities of all sorts. Digital technologies are for instance to be found in research, teaching as well as in activities of service provision – the three tasks conceived to be central to the academic profession (Fairweather, 1996; Peters, 2006; Robins & Webster, 2002). As far as research is concerned, publishing and reading of research findings is effectuated more and more by means of online journals instead of (only) by books and paper journals; the world wide web and recent phenomena such as social network sites are scrutinized more and more by means of digital methods; and so forth (Baym & Markham, 2008; Moris-Babb & Henderson, 2012). The same applies for teaching: teaching is no longer only effectuated in traditional auditoria, but also in electronic learning environments such as Blackboard or by means of web lectures that are being put on websites that are no part of traditional university infrastructure (e.g. Academic Earth, Coursera, TED lectures, YouTube); the traditional blackboard has received company of and is sometimes even replaced by PowerPoint and Prezis, etc. Finally, the academic's service task is equally being conducted with the assistance of digital technologies: communication with different societal sectors takes, to a great extent, place by means of e-mail, Skype or other digital communication tools. Naturally, processes of digitization are closely related to the uptake and usage of digital devices: the list of digital devices that are being used in daily academic practices is long and continuous to expand.

The extent to which digitization has penetrated into daily academic life is so profound that statements as the ones above nearly amount to common sense nowadays, in the sense that they are uttered in many places and by many different people. Specifically with respect to the digital, most of these statements emphasize that *technological* developments result in particular *social* consequences; consequences that operate both on a micro (local) and macro (global) level (e.g. Illich, 1991;

Weller, 2011). It has, however, equally been argued that a lot of hyperbole surrounds current discussions about the role or impact of 'the digital' on universities worldwide (e.g. Woolgar, 2002; Ruppert, Law, & Savage, 2013). This dissertation deals with such processes of digitization as they are currently taking place in different universities and different research domains, but without making an a priori and clear-cut distinction between the techn(olog)ical and the social domain. Rather, both domains will be analyzed mutually, and without privileging one over the other.

This introduction shortly sets the stage for the doctoral research that is presented in the following chapters, and that has been conducted over the past four years. It does so by, first, presenting some arguments that revolve around the current condition of the university. Since a plethora of literature has been written around this specific issue, to such an extent that merely bringing all this literature together would probably require the extent of an entire dissertation, we will adopt a more modest approach. Rather than setting in stone what 'the' condition of 'the' university is nowadays, we will only point to some dimensions that are frequently mentioned, and argue that 'the digital' – broadly conceived – constitutes one such feature of the current condition of the university nowadays. In a second section, we shift the focus to different research approaches that empirically investigate this current condition. We will, thereby, make a distinction between contextual approaches that seek to account for macro-level transformations and micro-oriented studies that empirically focus on the self-understanding of academics with respect to different aspects of this current condition. We will argue that, by adopting either a personal or a contextual approach, the lion's share of this body of empirical literature is largely omitting how academic practices are composed on a daily basis. We argue, therefore, that the adoption of a third, *sociomaterial*, approach allows for scrutinizing how such practices are relationally composed. Rather than empirically focusing on individuals (e.g. 'professors') or structures (e.g. 'the university' as institution embedded in a broader environment), sociomaterial approaches are centrally concerned with describing how (academic) settings are relationally composed by a heterogeneity of both social and material actors. In a third and last section, we outline how this

dissertation, adopting such a sociomaterial approach, is consisting of six different chapters and introduce them shortly.

The current condition of the university

Over the last couple of years, common perception has arisen that universities are at once experiencing and facing important challenges. Under expectations from diverse (societal, economic, political, even academic) fields, universities are expected to change, rationalize, and modernize their current internal as well as external structures and agendas. Contemporary universities, it is argued, have to change in order to be able to tackle new challenges that present socio-economic constellations impose (for instance, the challenge of the transition to a knowledge-based economy and society). Changes have always occurred in modern universities, but seem to have accelerated – and we are focusing here particularly on the European context – since the concrete implementation of the Bologna guidelines and concurrent European policy initiatives in view of creating a competitive knowledge based economy and society. Both such initiatives have inaugurated an open, calculable space of benchmarks and performance indicators in which universities have to improve on a competitive basis (Haahr, 2004; Larner & LeHeron, 2004; Marginson, 2013; Olssen & Peters, 2005; Simons, 2007). In doing so, a particular emphasis on the university in relation to the economic sphere is being stressed amply – and often in close connection with the concept of 'innovation' (OECD, 2014). The European Commission (2006; 2012) for instance, by asking universities to embrace a modernization agenda, urges for reforms in view of an increased competitive position, partnerships with industry, and more generally framed as 'growth'. University rankings, by incorporating not only quantitative citing parameters but equally the extent to which universities forge bonds with the secondary and tertiary sector, point to similar economical appreciations, in the sense that universities are deemed to be more competitive if they file more patents or provide more service to industry than other universities do, for instance (Rauhvargers, 2013).

Taking account of the more reflexive literature on the current condition of the university (largely to be found in the humanities), such proclaimed changes are tied to different conceptions of what a university is, can, or should be, if compared to more traditional conceptions of roles that universities should fulfill. This reflexive and philosophical literature is often approaching the university as an *idea*, rather than empirically focusing on either the individuals in the university or on the embeddedness of the institution in broader societal developments (e.g. Anrich, 1960; Habermas, 1987; Jaspers, 1961; Oakeshott, 2004; Readings, 1996; Scott, 2006; von Humboldt, 1810). In what follows, however, we are rather focusing on the empirical research on the university which is largely to be found in the social sciences. Commonly mentioned in this respect is that universities are nowadays held to become more entrepreneurial (e.g. Slaughter & Leslie, 1997; Marginson & Considine, 2000), more privatized and marketized (e.g. Donoghue, 2008; Tuchman, 2012), more networked and global (e.g. De Wit, 2007; Nelson & Wei, 2012) and more and more virtual (e.g. Burbules, 2013; Newman & Johson, 1999).

The entrepreneurial university

A first feature of the current condition of the university is the (political, societal, economic) urge to approach the university in entrepreneurial terms. Conceived likewise, 'the university' then amounts to an organization (rather than an institution) that is positioned in a broader environment (rather than existing in and on itself) and constantly searching both to fulfill new needs and to improve its own performance (Ball, 1995; Simons & Masschelein, 2009). This entrepreneurial conception, it is argued, contrasts with conceptions of the university as a closed-bureaucratic organization, which exists more or less on its own and relatively independent of competition with other parties in the (educational) environment. Moreover, such an entrepreneurial university is not to be fulfilled in vacuo, but also needs academics and students who conduct in an entrepreneurial way: not only the university, but the academic and the student as well need to behave more and more in terms of needs, improvement, opportunities, and so on (Etzkowitz, Webster, Gebhardt, & Terra, 2000; Meyer, 2003). In other words,

contemporary universities are not only being characterized in entrepreneurial terms, they are equally promoted to behave likewise. As such, entrepreneurialism acts as a prescriptive concept which guides both how universities as well as academics in these universities should behave, function and act. Furthermore, even though entrepreneurialism is often approached as a monolithic concept, its manifestations are manifold and differ from context to context (Barnett, 2011).

The privatized university

In close relation with this first dimension, a second feature of the current condition of the university is that it is more and more susceptible to processes of and attempts at privatization, for instance the privatization of financing, of different functions of the university, and so on (e.g. Enders & Jongbloed, 2007; Tuchman, 2012). With privatization, we designate the various attempts to make higher education incumbent on corporate interests. Although such attempts are highly related towards entrepreneurialist conceptions, they are nevertheless not the same: one can be entrepreneurial without necessarily having to have a focal interest in privatization. The opposite, on the other hand, is hardly possible: attempts to privatize universities are almost necessarily tied to an entrepreneurial stance. These tendencies towards privatization are especially considered detrimental for the humanities, a research domain that was once distinctive for the university but that is thriving on a specific and other kind of logic, namely that of the university as having a *public* character (Marginson, 2011; Simons & Masschelein, 2009; East, Stokes, & Walker, 2014). With the gradual erosion of this public character of higher education in favor of increasing privatization, it is sometimes even presaged that the university as we came to know over the last centuries is doomed to disappear itself, instead transmogrifying into an organization that will deliver learning packages to learners in need of these specific chunks of knowledge, and patents and readily applicable knowledge to whatever the needs of the industry might at that moment be (Donoghue, 2008; Nussbaum, 2010; Simons et al., 2011).

The networked university

Under the influence of processes of entrepreneurialization and privatization, but equally of more general processes as globalization and the massification of the European higher educational area, contemporary universities are equally characterized as organizations that are in need of taking up a network(ed) structure. Such structures are characterized by flexible bonds between universities, between research centers, between different scientific disciplines and between academic entities and other sectors of public life (economy, labor market, etc.). Arguments in favor of a networked university moreover state that such bonds are not only proliferating, but that both the creation and the sustaining of such bonds equally needs to be reinforced. In this vein and in contradistinction with the (previous) structuration of universities as hierarchical-bureaucratic organizations (Clark, 1998), it is for instance argued that without the establishment and the sustainment of such internal and external bonds, universities will soon lose grounds to (quasi-)commercial spin-offs, private research companies, and other universities who do make connections and interact with other players in the field. This is argued to hold on the same two levels as described above. As institutions, universities need to become more networked. A network university is then concretely characterized by close relations and intensive interactions with external organizations and other universities, growing transdisciplinarity within the university itself, and horizontal cooperation (De Wit, 2007: 122-134). This equally applies to individual academics: academics need to function as 'information networkers', who not only have to establish many connections within their own research field, but equally with other scientific disciplines and the broader societal field (Latham, 2001). In this respect, the image of the network functions at once at a descriptive as well as at a prescriptive level, whereby network structures are both used to conceptualize the social realm as well as promoted as a tool for improving one's connectivity (Lewis, Marginson, & Snyder, 2005; De Wit, 2007; Standaert, 2012).

The digital university

A last commonly mentioned feature pertaining to the current condition of the university, is that the university is more and more being conceived in terms of a maximization of its virtual character: universities are then less and less determined by their physical localization, but rather by means of the digital ways in which they operate. This feature is, of course, closely linked to the evolution of providing instruction via virtual learning environments. Ever since the early 1990s, virtual learning environments were adopted as a means for the provision of more individualized instruction (Brown, 1998). Recent trends in web development such as Web 2.0 and the corresponding affordances for users/learners to generate their own content, MOOCs, the possibility of distance learning, and so on are currently gaining interest – and this often under the auspices of a cost-reductive and efficiency rationale (e.g. Bowen, 2013; Selingo, 2013). In a similar vein, the professional life of academics is equally increasingly rooted in digital technologies nowadays and influencing the very nature of the work they are conducting. This comprises analyses of decreasing borders between the home and the workplace, of publishing more and more online instead of in paper journals, of changing the ways in which lectures are being given, and so on (e.g. Ylijoki, 2013; Kuntz, 2012). Again, this digital feature not only applies to the personal level of instruction and that of academics alone. Equally, the university as a whole is assumed and ought to become more and more virtual, for instance in its collaborations with other universities, in doing research on a competitive basis, or in the provision of service for broader society. More generally, it has been argued that this fourth, digital dimension enables a more effective effectuation of the previous three: developments in ICT facilitate in and help the establishment of entrepreneurialism, privatization and networking (Etzkowitz et al., 2000; Newman & Johnson, 1999; Robins & Webster, 2002). Admittedly, and applying to all four features outlined here, in practice this distinction between universities on the one hand and their academics on the other hand is often kind of fuzzy and somewhat harder to discern: most of the time arguments about the university imply some statements about its academics, and vice versa.

Research approaches

This doctoral dissertation has taken place around these backgrounds, but should not be situated in these backgrounds. That is to say, by scrutinizing current academic practices, this dissertation is necessarily embedded in what could be broadly called the current condition of the university and that we have tried to untangle somewhat in the previous section. Yet, this doctoral research does not want to assume this current condition as an overarching and determining constellation of social evolutions that explain how the university is constituted nowadays, and often tied to a 'doom and gloom' scenario. Rather than that, the research interest of this dissertation was precisely directed at the concrete operations that happen in day-to-day academic practices, and this without assuming any explaining or structuring contextual characteristics. In other words, this dissertation attempts to conceive of 'the university' not from the point of view of its current condition, but rather as constantly being enacted in very concrete and daily academic *practices*, and with a special focus on how 'the digital' is operable in these practices.[1] In order to render this insight intelligible, in this section we present three different possible empirical approaches towards researching the university and elucidate why we conceive of the third approach (that is, that of sociomaterial studies) as being especially well suited for scrutinizing academic practices at the level of their composition.

Personal and contextual approaches

The majority of studies seeking to capture the current condition of the university do this by adopting either a personal approach or a contextual-theoretical approach. The subject of the personal approach is frequently directed at the *self-understanding* of academics, that is, at how academics

[1] This is the reason why this dissertation has as main title "Academic practice": rather than scrutinizing the university as an institution, this dissertation is directed at the *activities* that take place in the university (often denoted as 'academic' activities) and at what the people who work at the university (equally most of the time denoted as 'academics') do on a daily basis. Hence, the notion academic needs to be understood in a twofold way: as pertaining to the sorts of activities effectuated at the university and to the people working there.

perceive certain aspects of their jobs precisely. Often, these studies are inspired by an unease with how academics are concretely asked or implied to function in the university today. Many examples can be given here: tenure (Herbert & Tienari, 2013), publication pressure (Lund, 2012), mobility (Kim, 2009), assessment (Watermeyer, 2014), identity (Clegg, 2008), participation (Weller, 2011), and so on. The latter approach, on the other hand, tends to focus on how precisely broad technological and societal evolutions and processes *impact* the university today. Most of the studies in this approach equally arise from some sense of unease, but this time mostly with the current condition of the university as a societal institution and with concomitant aspects of privatization, digitization, and so on (e.g. Bowers, 2014; Fanghanel, 2012; Lyotard, 1979). Arguably, each approach has its own merits and succeeds in capturing some facets of contemporary university life. First, the *personal* approach often provides detailed analyses of different opinions and perceptions that academics might have regarding some specific aspects of the current condition of the university. This approach enables to come to grips with how precisely academics perceive certain evolutions and/or how they (are asked to) deal with certain changes. Second, the *contextual* approach enables to clarify that universities are no isolated isles but precisely embedded in and impacted by broader societal evolutions and thus often convincingly show this embeddedness and malleability of universities in a global, commercialized, digitized, …, playing field.

Both approaches, however, do not place particular focus at what is precisely happening at universities nowadays qua day-to-day conduct, and more specifically, how digital processes might be constitutive (or not) of this daily conduct. The personal approach, by stressing the human agency of specific individuals, often discards that each human is always situated in a setting that equally consists of other human and non-human actors, because this is just additional information that does not focus on these individuals per se. The contextual approach, by stressing the embeddedness of universities, often discards the very same: by stressing grand societal processes, this approach has little focus on what is happening exactly in concrete, daily, academic settings and how digital technologies (amongst other components) give shape to these academic settings (because it is too idiosyncratic). That is to say: both approaches

are barely interested in the *composition* of academic work, since this composition is either deemed to be moving away from the person (personal approach) or precisely deemed to be too close to the person (contextual approach) (Feldman & Orlikowksi, 2011). Nevertheless, over the last decades a few studies have been conducted which precisely unveil the potential of scrutinizing this composition of academic work (e.g. Hamon & Rotman, 1981; Latour, 1987; Latour & Woolgar, 1979; Romein, 1953). Most of these studies originate from a *sociomaterial* approach, of which we highlight some central features in the next paragraph.

Sociomaterial approaches

As will be elaborated to a far greater extent in the chapters that follow, sociomaterial approaches focus empirically on the relations and the types of relations between the many actors that can be found in different university settings, and on the role of digital and non-digital technologies herein – as actors themselves. In doing so, sociomaterial approaches are more or less indifferent as to which specific actors to study: the (sort of) actors that need to be studied is not predetermined from the outset. Rather, a heterogeneity of actors that can be found in a particular *setting* and how precisely these actors and relations make up a *practice*, is scrutinized. For now, we understand the term 'practice' as pointing to the doings, sayings, activities, understandings and routines that take place in such settings. In doing so, sociomaterial approaches are neither focused on personal meaning giving nor on contextual clarifications. Rather than that, these approaches are conceiving of academic practices as being constantly *in the making* (e.g. Latour, 1987; 2010). Thus, rather than trying to explain academic functioning through underlying processes and factors that are then considered to be prime movers in this academic functioning (e.g. privatization, digitization), this doctoral research is primarily interested in approaching academic functioning from a different angle: describing the university as practices that are in the making, rather than being 'made' (by such underlying processes and factors). The general research interest of this dissertation is, in other words, an interest in the academic in the university and in what happens when the university is considered in terms of 'academic practices in the

making': Can we confront descriptions of academic practices 'in the making' with scholarly literature that considers universities more as 'made practice' by primal movers such as privatization, digitization and marketization? Do these practices in the making possess a particularity, that is, is there something typical about academic practices? Finally, what about the digital in these practices? Adopting a sociomaterial approach implies that 'the digital' will be analyzed as an active agent and as inherently part of the practices that will be presented in the following chapters: rather than conceiving of the digital as a technological realm rigidly separated from traditional social life, in this dissertation the digital is conceived to be an integral part of different academic settings themselves (e.g. Gere, 2012; Rogers, 2009; Woolgar, 2002). By considering the digital as being integrally part of what academic practices are constituted of, we refrain from conceiving it as a contextual-societal input factor that would then influence the very nature of what it is to be an academic or a university today – as some sort of output resultant.

General outline

Inspired by these sociomaterial approaches, the main objective of this dissertation is to bring another voice into the two aforementioned (personal vs. contextual) debates. Rather than contextualizing or theorizing the university as an institution, we will approach 'the university' from the angle of what happens in very concrete daily practices. Equally, this dissertation does not focus on academics per se and as such does not adopt a personal approach. Rather, and conceived as being in the making, how the university and its academics appear today will constitute the concrete result (instead of the starting point) of this dissertation. The purpose, thus, is to stay as close as possible to what happens nowadays in concrete daily academic practices, without presupposing what would be prototypical about these practices (or what not). To phrase this in other words, this dissertation is primarily directed at the *composition* of academic work, starting from the contention that this composition is constantly enacted and in the making. A focus on the composition of academic work will equally allow for the creation of accounts where the digital is not approached as a clarifying or

contextualizing given, but rather as being inextricably part of the settings under investigation.

This dissertation consists of six chapters. All of these chapters are based on manuscripts that have been submitted to journals or have by now already been published. Because these chapters are also to be found elsewhere, it is possible to read each manuscript separately. However, reading this dissertation as a whole has the benefit of more fully apprehending the general thread that was woven over the past four years of doctoral research. Hence, we advocate for considering the chapters of this dissertation as being part of a more classic monograph as well. The choice for merging this more traditional format with a format that is based on scientific productivity might sometimes give way to some artificialities. These were, however, unavoidable. Although as much effort as possible has been put in writing a coherent whole and in streamlining the different chapters, there is a minimal amount of overlap between different chapters. Furthermore, although a dissertation is (and should be) valued according to coherence and uniformity, there has been an evolution in these chapters. The first chapter, for instance, is still staying very close to classical sociomaterial approaches. In the course of this research, however, we came to the conclusion that the premises of sociomaterial approaches are not always rigorously applied, and that this might be partly overcome when equally adopting a sociotopological stance. Another example consists of the vocabulary that is used in these different chapters. Precisely because the search for right words and visuals has been a central challenge of this doctoral research, many (quasi-)conceptual terms are to be found in this dissertation, and sometimes used in a slightly different way. Since this searching for the right words (the adequate account, as Latour has it) was a central challenge of this research project, this was unavoidable as well. In other words, the several chapters presented here should be considered as steps that have been taken in order to come to an alternative account of how we (can) speak and write about contemporary academic practices in particular and the university in general.

In the first chapter, the theoretical framework of sociomaterial studies as it is traditionally used is introduced. As just mentioned, this chapter is the oldest one and constituted, at that time, an attempt to elucidate the

preconceptions of sociomaterial approaches and to generalize some theoretical and methodological principles of these studies. As such, this manuscript primarily integrates traditional sociomaterial research, with a focus on sociomaterial approaches in the educational field. This chapter starts with distinguishing between representational and relational thinking – the former as being the general point of view in which much traditional educational research operates, the latter as belonging to sociomaterial approaches. Based on this distinction, this chapter furthermore outlines the prime sensibilities of sociomaterial approaches. By speaking about approaches instead of about one grand theoretical framework, we stress that sociomaterial studies are not so much directed at explanation, but rather to come to an understanding of how different practices are constituted precisely. The chapter concludes by pointing to the critical potential of these studies when adopted in the educational field.

The second chapter outlines central theoretical and methodological challenges that ran through this doctorate until the very end. That is to say, in trying to rigorously adopt the sensibilities just mentioned, we came to the realization that it did not suffice to merely adopt central insights and vocabularies from the classical (sociological) sociomaterial studies. Although sociomaterial approaches have always urged for deploying the right words, in the right place and at the right time, we came to the observation that many studies are merely stating that a practice is sociomaterially constituted, instead of equally *showing how precisely* this constitution looks like precisely. Therefore, this chapter is centrally directed at finding ways so as to make this showing more explicit. In order to do this, we advocate for the introduction of social topology in studies that seek to understand educational settings in terms of their relational distribution of actors and relations. Social topology, an orientation that seeks to adopt central insights of the mathematical field of topology, is a research domain that is relatively scarcely adopted in sociomaterial studies of education, but that nevertheless offers opportunities in order to come to an understanding about how the relational distribution of educational practices looks like precisely. Additionally, this chapter elaborates on the possibility of using figures in this respect and the relation of figures with the surrounding text. As such, this second chapter presents a theoretical argument that tries to set

the stakes for the empirical part of this doctoral research: establishing a rigorous relational manner of thinking; searching for ways to deploy visualizations as presenting figures (rather than representing pictures); searching for ways to combine these figures with a surrounding text (in a diagram); and searching for a mode of existence that is typical for the educational practices that one is investigating.

Based on the second chapter, the following four chapters constitute the empirical part of this dissertation. All four have the ambition to be rigorous applications of the central premises of sociomaterial and sociotopological approaches, and incorporate theoretical and methodological insights from the first two chapters. The third chapter is a thorough and detailed case study of the composition of academic work of one professor. It presents an innovative methodological technique, in which this interview was conceived as a kind of hearing, as an alternative to participant observation in cases where such observation is not appropriate or feasible. This manuscript outlines a first attempt at adopting and exploring figures as being integrally part of a study, and not as being mere illustrations. These figures take up the form of network visualizations, that were consequentially analyzed on three different dimensions: first, the constitution of an academic practice (scrutinizing actors and relations); second, its distribution (how different actors and relations are distributed in regions of activities, and the operational effects of such a distribution); and third, how these regions associate (the connections that are established between these regions). This analysis allowed for some first tentative conclusions, namely that there seem to be prototypical academic actors, that digital elements play a profound and highly specific role, and that the traditional threefold of education, research and service perhaps needs some rethinking if the university is approached through the lens of what happens in concrete practices.

The fourth chapter expands the scope of the third, while trying to remain as detailed and as profound. The focus in this chapter shifts from one singular practice to a variety of academic practices. Since we equally made use of network visualizations in this chapter, but this time pertaining to a variety of academic practices, we designated this chapter as being an *atlas* of academic practice. Drawing on both sociomaterial studies and sociotopology, this chapter presents three different profiles

of academic practice that are different qua forms and qua implications of these forms (e.g. the enactment of particular sorts of spatiotemporal constellations). This chapter concludes by suggesting that there might be typical actors and forms to be found in academic practice; that actors which are situated at the boundary of two regions are perhaps especially important; that especially digital elements play an important role in this respect; and equally suggests some characteristics of what an academic mode of existence might entail.

The fifth chapter is the result of an ethnographic study conducted in two research centers. The focus of this chapter is exclusively directed at the role of 'the digital' in contemporary academic practices, and more especially at the prototypical device that is associated with 'the digital': the screen. In order to give an account of what screens do precisely, this chapter presents different academic settings in terms of their *choreography* and by focusing on three choreographic dimensions. We thereby focus on the *sceneries* of academic settings (the positions that academics and other actors need to uphold in order for the screen to be able to operate); the *roles* that the screen performs (the different performances of the screen in these settings) and the *script* that is present in these settings (that is, the interplay between the screen and other actors, and moments at which the screen is 'in tune' or 'out of sync' with other actors). The prime findings of this analysis are that the screen always inaugurates a before, that is, that the screen is much more than something one simply sits or stands behind; that the screen performs various roles, but always one at a time; and that there are moments at which different activities are (in)compatible with each other, because the screen and other actors are out of sync (or in tune). In the conclusion, these findings are related to the impression that many have that screens have altered (the nature of) academic work.

The sixth chapter equally reports of this ethnographic study, but has a different focus. Rather than analyzing the operations of the screen as such, the prime purpose of this sixth chapter is to come to an understanding of what is precisely 'academic' in what we nowadays often unreflexively call 'academic'. This is a question centrally pertaining to the academic *mode of existence*: how do academics exist nowadays? Rather than merely focusing on where (and moments on which) academic practice is

to be situated, the central issue that this chapter tackles is the specific 'way of being' of academic practice: *how* does academic practice exist nowadays? In order to answer this question, we identify four types of attachments that run through the various activities we observed during our ethnographic research. In a relational vein, we argue that each of these attachments always inaugurates a twofold process. This chapter concludes with the argument that academic practice is nowadays characterized by *distancing in action*, that is, both by seeking to draw things together and by slowing things down.

Ultimately, in the conclusive section that brings this dissertation to a close, we bring these six chapters together. In this general conclusion, we explore the results of this inquiry into academic practice, and assess the theoretical contribution of this dissertation (which is directed at the elaboration of a rigorous relational thinking), its methodological contribution (which is directed at deploying visualizations in a relational manner) and its empirical contribution (which is directed at coming to grips with how the university exists nowadays and what the role of 'the digital' is herein). In doing so, we equally raise some additional remarks pertaining to the whole of this dissertation, and try to come full circle, that is, making the statement that sociomaterial description has a critical capacity fully comprehensive.

CHAPTER ONE: ON THE CRITICAL POTENTIAL OF SOCIOMATERIAL APPROACHES IN EDUCATION[2]

Introduction

Recent years have seen a growing interest in the material dimensions of educational practices. All of a sudden, materiality is all over the place and receives a lot of attention from different theoretical points of view such as material culture studies, activity theory, organizational theory, and so on (e.g. Smeyers & Depaepe, 2014; Engeström, 2014). In this chapter, we focus on one strand of such studies that have recently started to proliferate in the educational field and which can be broadly termed as *sociomaterial approaches*. These approaches share an analytical approach in the sense that they refuse to separate the human dimensions of educational practices from their material dimensions, and rather focus on the relational composition of these practices. Albeit their nomenclature differs (some studies are designated as actor-network studies (e.g. Fenwick & Edwards, 2010; Fox, 2005); others as assemblage studies (e.g. Gorur, 2011; Koyama & Varenne, 2012) and socio-technical or sociomaterial studies (e.g. Luck, 2008; Orlikowksi, 2007), their more general approach of analyzing educational practices from the point of view of the relations between actors present in such practices (rather than considering these actors as atomic agents), is largely similar (Fenwick, Edwards & Sawchuk, 2011). In this chapter, these strands are considered simultaneously under this umbrella term of *sociomaterial approaches,* thereby pointing to this generally shared relational point of view rather than to their differences. By upholding such a relational point of view, these approaches reframe the way in which we think about (divisions between) traditional categories of

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educational practices, such as micro and macro, individual and structure, human and material, and so on. More particularly, rather than posing an a priori distinction between these categories, these approaches accentuate the intricate mixture of, and the according fuzzy distinctions between, the social and the material, the human and the non-human – and, hence, the otiosity of clinging to these often taken for granted distinctions. In doing so, sociomaterial approaches do not take (individual) intentions and sense-making, general context, grand narratives or frameworks as a means of clarification of what happens in these settings, but rather consider these at best as being potential outcomes of a study, instead of as a point of departure (Fenwick & Edwards, 2010; Law, 2009a; Murdoch, 2001).

This first chapter aims to offer some elaborations on these research strands and consequential endeavors to decenter both human subjects and non-human objects in educational studies in favor of treating educational practices as relational, composed, and at least partly material, assemblages that are constantly emerging. The central point we want to make is that sociomaterial approaches possess a *critical capacity* vis-à-vis the educational field, but that this capacity is still largely underexposed. In order to come to this argument, this chapter starts with the introduction of the rudiments that are common to these sociomaterial approaches, viz. a *relational thinking*. We contrast this relational thinking with the more traditional approach of representational thinking and highlight its main features. Starting from this conception of relationalism, a second section elaborates upon three characteristics of sociomaterial approaches, and illustrates how these characteristics are currently being deployed in educational studies. The adoption of these three characteristics, we argue in a third section, enables to frame the argument that sociomaterial approaches possess the capacity to add a critical dimension to the educational field. In order to make this argument, we outline how we conceive of this critical dimension (that is, as *critical creativity* rather than as critical theory), what this critical dimension enables to show, and how this dimension might be concretely deployed in contemporary educational studies. As we will argue, this will counteract the argument made by some that sociomaterial studies are in essence about 'merely' describing and in that sense a-critical.

Representational versus relational thinking

Representational thinking

Representational thinking constitutes the driving force behind the majority of scientific research since the advent of modernity (Latour, 2004a). This modern worldview presupposes the world to consist of two different and independent kinds of entities: on the one hand, a human realm consisting of delineated individuals with idiosyncratic intentions, affections and interpretations; on the other hand, a natural realm of solid facts stripped from such interpretation and signification, waiting to be known and hence represented by human entities. Representational thinking, then, amounts to:

> [T]he belief in the ontological distinction between representations and that which they purport to represent; in particular, that which is represented is held to be independent of all practices of representing. That is, there are assumed to be two distinct and independent kinds of entities—representations and entities to be represented. The system of representation is sometimes explicitly theorized in terms of a tripartite arrangement. For example, in addition to knowledge (i.e., representations), on the one hand, and the known (i.e., that which is purportedly represented), on the other, the existence of a knower (i.e., someone who does the representing) is sometimes made explicit. (Barad, 2003: 804)

Representational thinking thus differentiates between humans, human knowledge and the natural world as it is. This 'system of representation' (ibid.), or this 'modern constitution' (Latour, 2004a), has both been presupposed and theorized in terms of an arrangement that distinguishes the natural world from the social world and which Latour designates as two 'collectors'. The natural world, on the one hand, is operating as a distinct collector stiffed with 'matters of fact', that is, with a gamut of natural objects that take an unproblematic place in the (co)existence of human beings. These matters of fact are considered to be objective and immutable (their determining characteristics remaining constant over time) and constitute the array of what can be known, or rather, represented. The knower who effectuates the representing, on the other hand, is part of the social world, a messy domain in which human subjectivity, idiosyncratic interpretation and values reign. Representationalism assumes this second collector to be vexatious and

imprecise: since its inhabitants ('humans') are part of the social, they are at pains in representing states of affairs accurately. Thus the significance of knowledge (i.e., objective representations, corresponding to the prior reality of the nature-collector) gained by Science, constituting the bridge between the knower in the society collector on the one hand and the known in the nature collector on the other. Science, producing knowledge (in the form of representations), then occupies an intermediary, gatekeeping position between the representer and that which is to be represented, and conceives of its task as primarily being to reflect the natural world as accurately as possible. In this system of representation, the scientist is positioned in between the two collectors, or more precisely, is the only one who is able to travel between the two different collectors. It is because of this intermediary position of science and scientists, in between the natural and the social collector, that the necessity of obtaining a representative sample, of measuring as reliably as possible, of applying the right techniques of data gathering and analysis, and so on, are rendered extremely important: the facts (representations) that Science (and scientists, doing the representing) yields should be as close as possible to the natural world as it really is (what is represented). In other words, *mediation* (as less as possible influencing what one is investigating) and *reflection* (as precisely and as objectively as possible representing what one has found) are central concerns in representational thinking: Are the scientific representations a veracious mirroring of what is to be represented, namely the objects in the nature-collector? Is the retrieved knowledge of the representer mirroring the world as it is? The importance of mediation and reflection undergirds the idea of a knowable natural world 'out there', independent of both humans and non-humans who are only potential knowers by means of representation (Barad, 2003; Latour, 2004a; Rorty, 1979; Verran, 1998).

This representational thinking is present in many research currents scrutinizing the educational domain in general, and how one perceives 'educational research' in particular (even though it is rendered even more complicated here than it already is in the natural sciences, since in the nature collector are there now humans to be known). A first example is evidence-based education policy. Evidence-based policy seeks to retrieve knowledge as valid and as reliable as possible about some features of an

educational system (pupils' attainment, for instance) in order to inform the political realm (positioned in the social collector), which is often reproached of conducting policy on a normative basis and merely motivated by values and opinions (that is, too much mediation and too few reflection). In order to inform this value-laden political realm with proper scientific facts, validity and reliability are of the utmost importance, leading to a searching for methodological and statistical techniques that aim to be as valid and as reliable as possible, such as for instance value-added modelling (Decuypere et al., 2011a; 2014; Gorur, 2011; Nóvoa & Yariv-Mashal, 2003). A second example is the examination of pupils' opinions, emotions, and so on, by means of surveys (Law, 2009a). Again, what can be seen in this respect is the utmost importance of a continuous searching for making sure that one effectively measures the things one wants to measure. In order to obtain legitimate scientific facts, not only is it of focal importance that the researcher poses the right questions, that is, measures what she wants to measure. It equally is of importance that one takes into account the biases (i.e., distortions that arise from putting humans in the investigable nature-collector) that can arise from posing these questions to pupils who can distort the accuracy of what one wants to measure. Hence the creation of wide Likert scale answers, for instance, so as to ascertain that pupils do not stick to the middle ground of the continuum, because that is what humans appear to be inclined to do. The researcher takes the bridging position here as well: not only on behalf of herself and the questions she poses in order to come to valid and reliable representations, but equally on behalf of the processes of signification of the pupils (whose interpretations can distort this if not adequately controlled).

These two examples are only examples, but they are specially apt in the sense that they are focusing on the two central notions of mediation and reflection, and thereby explicitly recognize the representational view and its concomitant two collectors.[3] Rather than assuming two

[3] The argument could equally be made for qualitative-interpretative research: the researcher is then analyzing interpretations of human subjects that point to something bigger than only these interpretations (a fact; a general pattern; a theory; an evolution; and so on). Here as well, she takes a bridging position in

distinguishable collectors (and their according bifurcation) and granting representations a central role, sociomaterial approaches approach education on one flat relational plane in which both social and material actors relate with/to each other.

Relational thinking

The central tenet of relational thinking is that it discards the system of representation with its two collectors. Rather than a collector of humans separated from a collector of natural objects, in relational thinking both of them are considered at once. That is to say, in relational thinking, anything might potentially relate with anything else, and this without assuming a priori differences between different actors (see also below). This has especially been given attention in sociomaterial approaches, which attempt to trace all the relations between different actors that make up a particular educational setting. In doing so, sociomaterial approaches conceive of every actor as being relationally positioned in a web of relations with other actors. In this view, all things are what they are – and can only be what they are – in relation to other things (Law, 2009a; Gad & Bruun Jensen, 2010). In other words, relational thinking conceives of agency as being a distributed effect of different actors, instead of being situated in one human actor solely (Callon & Muniesa, 2005).

In a study of workplace learning, for instance, Thompson (2012) presents how the delete button – traditionally conceived as being a mute object, nothing but a key – holds a central role in online communities and is crucial in the effectuation of practices of workplace learning. In a relational vein, Thompson not only contends that this button plays an active part; she moreover argues that this button is entangled in a network of different actors, consisting of for instance the learner, the screen, the things that appear on such screens ('online digitalia'), and the digital device of the computer. Likewise, the delete button should not only be thought of in terms of taking up an active role (that is, in terms

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between the two collectors: she is the one who is able to retrieve these facts and patterns and bring the conclusions back to the other collector.

of being an actor), but equally in terms of only being able to play an active role precisely because it relates to many different other human and non-human actors: it are these other actors that codetermine the button's capacity of exerting agency. In that sense, the agency of the button is conceived as a relational effect. In the traditional system of representation, such an analysis would be very difficult to make. Instead, the focus would rather be exclusively on the *function* of the button (deleting content) or on how this button *hinders* or *facilitates* the creation of an online learning community. Similarly, Bigum (2000; Rowan & Bigum, 2003) studied the emergence of web-based teaching, taking up a relational approach. Bigum argues that in such emerging contexts, something (i.e. technologies for online learning) is only made durable, that is, becoming taking for granted, if and when it succeeds in building alliances with different actors (documents, committees, staff, students, computers, etc.). That is to say, educational technologies do not become durable in and on themselves, but only in so far as other actors relate to these technologies (thereby rendering them important). Other examples of such relational thinking have for instance been conducted in educational policy studies, arguing that what is deemed to be important in policy terms (e.g. policy documents, neoliberal discourse, numbers, etc.) is not important in and of its own and even has no relevance in and of its own. A policy document, for instance, is not important just because it is issued by a central government. Rather, it is precisely the other way around: it is by and through relating to such a document, and this by many different actors, that the document gains importance, and that consequentially something as a government might come into being (e.g. Gorur, 2011; Hamilton, 2011).

By approaching educational practices likewise, a relational way of thinking implies the abeyance of the aforementioned system of representation. Rather than presupposing the existence of two distinct collectors, the vantage point of relational thinking is precisely situated at investigating both the social and the natural (or the material) together, as pertaining to the same relational realm. By scrutinizing the relations that establish between various actors, relational thinking is largely interested in how such practices are always in the process of being in the making, that is, how the relations between different actors *enact* something as being an online community, an educational technology, or a policy

document (see also Barad, 2007; Law, 2006a). This is then no longer an ontological concern (that is, concerning the way things are), as it is in the system of representation, but rather a question of *ontogenesis* (that is, concerning the way how things come to be), and constitutes one of the focal interests of relational thinking: *'how humans and things come to be – how they* become – *as effects of the arrangements in which they are entangled'* (Sørensen, 2009: 13).

This approach changes the position of the actors involved in a setting as much as it changes the role of 'knowledge' and of the researcher herself. First, instead of being merely passive objects waiting to be known, relational thinking conceives of the actors under investigation (social and material) as both being active and productive: since both of them are important in the coming into being of something (a policy document, an online community, etc.), agency is not situated in these actors themselves, but rather in how these actors emerge in and through the relations they uphold. Second, knowledge is no longer so much about representing the facts one has obtained as it is about *presenting* how a practice comes into being. Third, in this approach the researcher is no longer conceived as adopting a bridging position: rather than adopting a disinterested and external gaze in order to objectify the natural world, in a relational vein the researcher is equally part of the world and takes up an active (that is, mediating) role herself. That is to say, she no longer neutrally reports of what she sees, but rather registers the relations that are established in the settings she has investigated, and how these relations are leading to particular features of a setting (for instance: not so much pointing to the observation *that* a policy document is transformed from being a mere text into an authoritative document to which many other actors refer, but meticulously describing *how* this happens).

Consequentially, the criteria of reflection and mediation are rendered superfluous: since a stable division between objects and subjects and representation (of facts) is replaced with sundry relations and registration of these relations between different actors, what is at stake or what determines valuable research are no longer such reflections. Instead, the quality of the research project amounts to the extent to which one succeeds in showing how different relational constellations are distributed precisely, and more precisely the extent to which one

succeeds in composing an account in such a way that a certain educational practice is *performed*, that is, *given a form* (Latour, 2005a: 136-140). Put otherwise, whereas the reflective component is not given consideration here, the component of *accuracy* is rendered extremely important in the sense that not only accurate registration of relations is of crucial importance, but equally the accuracy of one's descriptions: *'A good text is never an unmediated portrait of what it describes (…) It is always part of an artificial experiment to replicate and emphasize the traces generated by trials'*, Latour states (ibid.: 136). These 'traces' are the relations established between actors. The notion 'experiment' points to the artificiality of writing an account, that is, this never comes about naturally but needs time and effort and needs to be composed in such a way that it gathers the different actors present in a certain setting.

In order to fully apprehend what both this gathering and this composition of an adequate account means, the next section elaborates on three key characteristics of sociomaterial research that issue from this relational approach and that show how sociomaterial approaches aim to uptake such relational thinking in a rigorous manner. By expanding on these three characteristics, however, we do not intend to present sociomaterial studies as being structuring theories or clarifying theoretical frameworks. Rather, and as stated, they should be considered as being relational *approaches* that focus on emerging phenomena (Fenwick & Edwards, 2010; Mol & Law, 1994). As such, it is more appropriate to consider sociomaterial approaches as a call for the researcher to be imbued by particular *sensibilities* rather than as full-fledged theoretical body. As the next paragraph argues, these sensibilities are, first, that the settings under investigation should be conceived *symmetrically*; that relations are, second, not neutral but always enact some *performative* effects; and, third, that the accounts one composes are always directed at assembling *maps* of the settings investigated. These three sensibilities will not only elucidate what is meant with the gathering of actors and with the composition of an adequate account, they will also – and more importantly – ultimately allow for rendering the critical potential of sociomaterial studies explicit.

Sociomaterial studies: Key characteristics

Symmetry

When adopting a relational approach to educational practices, it is hopefully clear by now that the aforementioned bifurcation between the social and the material, culture and nature, the human and the non-human has no *initial* analytical importance. By thinking in terms of relations, the focus – the sensibility – of the researcher is directed to the agency of different actors which are all treated as belonging to the same analytical plane: Which actions are performed, and which relations make it possible that such actions are performed (and the other way around as well: which actions are thereby not performed)? Sociomaterial studies thus emphasize the heterogeneity of the practices they investigate: consisting of a varied range of different actors who are analyzed in the same way (and starting from their relations). This has been designated as a sensibility towards *symmetry*: each part of the traditional fissure between humans and non-humans is being given equal analytical consideration (Callon, 1986; Fenwick & Edwards, 2010; Law, 2009a; Murdoch, 1997). Of course, this is not to say that there are no differences between humans and non-humans whatsoever – for this would again imply a return to the aggregates – but rather that the sorts of actors populating a certain setting and how these are related towards each other should not be assumed beforehand, since this is precisely what sociomaterial studies try to disentangle empirically (Law, 2004; Oppenheim, 2007). Indeed, the first sensibility of sociomaterial approaches directly relates back to the relational implications discussed above: the point is to pick up relationality as a logic which is not so much interested in categories or aggregates, but rather wants to analyze how actions emerge in and through relations. The sensibility of the researcher is then directed at adopting a gaze that approaches any educational setting as a *distribution* of actors and relations '*in which all entities are initially* (only initially) *equal and indeterminate'* (Law, 2006b: 88, emphasis added). The latter point is of importance, since it stresses not that humans and non-humans are *the same*, but rather that thinking in terms of relations implies not to place any actor *analytically* above another.

This symmetrical sensibility has been adopted by educational researchers in order not to exclusively focus on human actors alone and to describe how different educational settings are relationally instigated by both the social and the material. This is precisely what Sørensen (2009), scrutinizing the materiality of learning, is after. For her, educational practices do not consist of empowered and active subjects on the one hand and mute, passive objects on the other. Rather, by means of an empirical analysis she shows how daily classroom practices are critically given shape by means of both people and things, to such an extent that it is, at the end of the analysis, hard to make a difference between 'the' social and 'the' material. In a similar vein, Clarke (2002) adopts this symmetrical sensibility in order to come to new understandings of literacy and where this literacy might be found (that is, not solely in the person, but in a relational constellation of various sociomaterial actors). This symmetrical disposition enables her to come to new conceptualizations that offer prospects so as to reconceive literacy (for instance, coming to new orders and classifications that escape traditional theories of meaning connoted with literacy). Other studies have adopted this symmetrical disposition in order to highlight these actors (social and material the like) that are often *black boxed,* that is, entities that play a decisive role in different educational practices but that are, in a traditional representational framework, often ignored or put into the background (e.g. de Freitas, 2012; Waltz, 2006). Hence, educational studies that adopt a symmetrical disposition offer the possibility of both raising and answering questions as: What, or who, is being related to? How is this being done? What, or who, is not related to? Why?

Performativity

As argued hitherto, sociomaterial studies focus on heterogeneous educational settings as relational and flat planes that are always in the making. As such, they conceive of reality as process or as becoming. The focus of sociomaterial approaches is not only on the *distribution* of different settings, as if one would suffice with tracing the relations that are established between different actors. This would only be an exercise of mere registration of actors and relations in such settings. The point of symmetrically focusing on such relations, however, is that such

sensibility enables to become sensitive to what happens in a setting (as an arrangement of interconnected entities) at the level of its *effects,* that is, at which effects are established in and through the relations that are formed. This is where the notion of *practices* comes in: even though the analytical focus is first on (the registration of) relations, in second instance sociomaterial approaches aim to articulate the different effects generated by these relations. The term 'practice' hence points to the specificity of what happens in a particular setting, that is, to the effects that are generated by the relational interplay of actors (Schatzki, 2010 – see chapter 2 for further elaboration). Many examples could be given here, such as more generic effects that inaugurate particular sorts of space and time (e.g. Koyama, 2015; Landri, 2015), but equally specific effects of the relational setting on particular actors: some are being heavily related to and are thereby – as an effect – transformed into authorities or centers; others are very scarcely related to and thereby only of peripheral importance (Latour, 1987; Verran, 1999); and so on. In sum, the second sensibility points towards what could be termed as the *performativity* of actors and relations between these actors in educational settings: the realization that (and a sensibility for) realities (that) are produced effects of different situated enactments (Law, 2009a; Seddon, 2014).

Mappings

A third characteristic of sociomaterial research is related towards the composition of resulting accounts, conceived as being a process of assembling. 'Assembling' in this respect relates to the particular *actions* the researcher undertakes in scrutinizing and reporting of this setting. Hence, the assemblage notion does not point to a structure to retrace (as in: "This particular reality consists of these specific assemblages"), but rather points to a *means of analysis* by means of which to approach the setting(s) under investigation (Ong & Collier, 2005; Marcus & Saka, 2006). This means of analysis largely consists of observation and according descriptions, and more specifically of following the actors in a particular setting in order to scrutinize how different educational settings are relationally composed. The aim of sociomaterial analyses is to present a detailed account of the distribution of actors and relations of this

setting and the consequential effects of this relational distribution. By and large, this could be termed as a cartographic way of researching, in which this mapping allows to see and describe the relations by means of which a setting is constituted. This mapping needs to be understood in a specific manner, however, that is, in a performative and not in a mimetic sense: in a sociomaterial vein, mapping is not conceived as an endeavor aiming to faithfully represent a setting, but rather as an activity of description that aims to produce an adequate account and that presents (rather than represents, reflects or explains) such relational compositions (Pickles, 2004; November et al., 2010). In a relational point of view, cartographic activities (and such cartographic descriptions might be effectuated visually as well as textually) are then not concerned with reflecting what was seen, but rather with gathering the actors and relations composing a certain educational setting, and with presenting the particular educational practice that is consequentially enacted. As such, maps (both written and visual) are considered as active devices themselves: *mappings* instead of maps (Fenwick, 2010a; Kitchin & Dodge, 2007).

Designating sociomaterial research as cartographic research helps in understanding what these studies try to attain in educational research: they attempt to present an account of the investigated settings in such a way that the focus is not directed at holistic explanations but rather at assembling descriptions. The resulting maps, then, might be visually or textually (or a combination of both) oriented, but their focal intention is to present the reader with an adequate account of some educational setting that aims to come to an understanding of the specificity of this setting and of the mechanisms and operations that are at work in these settings. Ceulemans and colleagues (2012), for instance, present a cartography of standard formation in teacher education. By mapping how these standards operate, are rendered operable and how they make other actors operational, they present an account that aims to show how some actors start to act as an obligatory passage point. That is, by mapping how a teacher education setting looks like today, their analysis enables to show/present (rather than explain) the effect of such passage points and how contemporary teacher education is typically shaped through actors that hold a central role in these practices. Similarly, Nespor (2011) undertakes a cartography that presents how educational

change is not only the feat of human actors, but equally critically shaped by devices. Again, the purpose here is not to consider such devices as holding the same status as humans, but rather, by means of mapping as a research technique, to show that devices (in this case, a demo as an instructional device at a university) are active actors instead of mute objects. Nespor's cartography shows, for instance, the distribution of actors (professors, producers, the instruction demo, grants, etc.) necessary for the device to come into being. Furthermore, the cartography displays not only the distributed agency of this device (the device cannot be conceived in and on its own, but directs agency of other actors and leads to different performative enactments) but equally the various mechanisms that are at work in this university setting (inscribing the device into a text; translating it into policy priorities; enrolling other actors, etc.).

In sum, what can be gained by such cartographic endeavors is not explanation or generalization. Rather, this third sensibility points to attempting to present the relational distribution of educational settings in such a way that one might be able to come to grips both with mechanisms that are at stake nowadays in different educational settings and with the specificity of how such mechanisms operate. This implies that sociomaterial studies are always in search for proper words: rather than giving an explanation of what happens of an educational setting, the vocabulary deployed aims at once to stay as close as possible to the setting under investigation and to give an account of what was specifically seen in a particular setting (Latour, 2005a). This pertains to the (sorts of) relations that are established as well as it points to the (sorts of) actors and the (sorts of) effects: which actors and relations are composing a practice? Which sorts of space and time eventually emerge? Etc. Even though such vocabularies will to a great extent be specific to the setting one has investigated, this is not to say that they would have no relevance at all beyond the particular setting: they might resonate with other studies, might be linked with other cases, might be adapted or tuned to other studies, and so on (ibid.; Nespor, 2011: 33).

The critical potential of sociomaterial studies in education

Based on these premises, in this last section we want to make a case for the *critical capacity* that these sociomaterial approaches possess. The importance of stressing this critical capacity is threefold. First, it is a fruitful means by which we can concretely argue that sociomaterial approaches have something more to offer than just 'mere description'. Even though the above probably already indicates to some extent that sociomaterial approaches are about more than description alone, there is controversy as to whether or not these approaches have a critical capacity or not (Whittle & Spencer, 2008 – see for an elaboration of the argument Edwards & Fenwick, 2015). In this respect, we will argue that the descriptions generated by sociomaterial approaches are already critical *in and on themselves*. Second, this might inform a revival of critique in a time where it has "run out of steam" (Latour, 2004b). Indeed, it seems as if we have critiqued everything over the last years, have debunked nearly every aspect of what education is or could be, but where does this all lead to? To state it with Latour (2010a), aren't there enough ruins already? If we have gained insight that everything is constructed, for instance, what can we concretely do with such insights? Does this stretch any further than the academic circles we present these insights to (Edwards & Fenwick, 2015; Hacking, 1999)? Isn't there a better option to pursue, that is, an option that seeks to offer propositions rather than merely debunking what is held to be true? Third, we argue that this critical capacity of sociomaterial approaches is especially relevant for educational research, in the sense that this critical capacity might lend to elucidate some aspects of what education(al research) is all about and equally might give rise to concrete (sorts of) descriptive *interventions* that are opened up in this process.

The notion of 'critique' has to be understood in a specific way, however. In a representational vein, critique largely amounts to debunking and unveiling what was hitherto hidden: certain aspects of the educational domain are then not what they seem, or render particular hidden effects visible (e.g. Hacking, 1999; Latour, 2004b). The critical position of the researcher in this respect largely amounts to unveiling what is not (yet) known and what we (yet) hold to be 'true', and constitutes another perpetuation of the system of representation:

> With critique, you may debunk, reveal, unveil, but only as long as you establish, through this process of creative destruction, a privileged access to the world of reality behind the veils of appearances. Critique, in other words, has all the limits of utopia: it relies on the certainty of the world beyond this world. (Latour, 2010a: 475)

This conception of critique amounts to invoking superjacent and hidden interests, (f)actors, fields of power, rationalities, and so on, that frame what is, what can be done and how this should be done. The knowledge thus generated is considered to be emancipatory in so far as it assists in the development of rationality, self-reflection and a better understanding of the situation one finds oneself in (Simons et al., 2005: 819; see also Masschelein, 2004 and Simons, Olssen & Peters, 2009).

Conceived from a relational and sociomaterialist approach, however, critique points to something other (and we just sketched the representational approach here in order to designate what it is not, not as much to critique the notion of critique – which would be a rather odd kind of catch-22). Instead of debunking and unveiling, in a sociomaterialist vein critique is situated in the ability to *intervene* in what could be called matters of concern (in contradistinction with the matters of fact in representational thinking – Fenwick & Edwards, 2010). This intervention is not the intervention of the representationalist critic who focuses on *'guarding, judging, legitimating, monitoring, saving or securing'* (Simons et al., 2005: 827). Rather than that, as Latour argues, the word should be connoted with optimism through and through, since the aforementioned sensibilities of sociomaterial approaches at the very least open a space where critique can be deployed as a means to compose and to assemble. In a sociomaterial vein, critique is utterly affirmative and experimental, instead of destructive and (merely) conceptual (Edwards & Fenwick, 2015). In this respect, the person of the critic is then not a debunker or an unveiler but an assembler who gathers different heterogeneous actors together, not a distant objectifying scholar but – to use terms that might perhaps sound somewhat unfashionable – an *engaged* and *caring* one:

> The critic is not the one who debunks, but the one who assembles. The critic is not the one who lifts the rugs from under the feet of the naïve believer, but the one who offers the participants arenas in which to gather. The critic is not the one who alternates haphazardly between antifetishism and positivism like the drunk iconoclast drawn by Goya,

> but the one for whom, if something is constructed, then it means it is fragile and thus in great need of care and caution. (Latour, 2004b: 246)

It is this conception of critique as a way of relating to, engaging and experimenting with, and (re-)composing the present that we want to explore in the remainder of this chapter (Simons et al., 2005; 2009). More particularly, this is then less an arguing for critical theory and a resistance to the present as it is an argument related to *critical creativity* which is centrally directed at attachments and gathering, rather than at detachment and taking apart (to sharpen a distinction made by Braidotti, 2013a). Based on the arguments raised in the previous sections, we argue that educational sociomaterial studies can be conceived to have a critical capacity understood likewise on at least four levels, and that these studies are in this respect more than only a 'merely descriptive' tool to use. To be clear, this is not to state that description is a bad thing or would not suffice in and on itself. On the contrary, the position we advocate for here is a position that runs *through* such descriptions and that thereby conceives of these descriptions as already being interventions themselves.

First, sociomaterial description always implies an act of *gathering*, that is, of assembling a variety of actors that are present in a particular setting into what we have called an adequate account. This is not a distant endeavor, as it is largely portrayed in the system of representation. Rather than that, it is an account (not a neutral rendering of facts) that is aimed at being adequate (that is, that makes a description of the actors gathered in such a way that these actors can 'speak for themselves', instead of being 'spoken about'). This act of assembling is an act of *composing*: it entails a description of what has been gathered through registrations. By drawing various actors together into a description, what is rendered clear likewise is not only that 'nothing stands on its own', but equally and more importantly that if nothing stands on its own, what is deemed to be important or worthwhile needs to be related to (or otherwise, it would disappear). By scrutinizing how different settings are relationally composed, sociomaterial studies are hence highly aware of both the fragility and the stability of certain compositions, since both fragility and stability are a relational result that can be made as well as be destroyed. This implies that through their descriptions, sociomaterial

studies have the critical capacity of opening up contemporary assemblages by describing them empirically, and hence of turning factual givens into actual concerns, that is, as gatherings of actors that are in need of care and need to be treated with caution. This is critical in as far as it implies that educational practices are reconceived, drawn out of the factual realm and instead being turned into matters of concern and in as far as this enables engaged and caring publics of researchers, students, teachers, etc. to gather around such matters of concern (Decuypere et al., 2011a; 2014; Masschelein & Simons, 2013a).

Second, based on these descriptive accounts and as the examples in the previous sections hopefully show, sociomaterial approaches have the generative potential of both presenting that what is unfamiliar in educational settings and of re-presenting the familiar in such a way that what is often not given (many) consideration is presented as well. This applies as much to the many material actors present in a particular educational setting as it applies to social ones: instead of only considering traditional and to be expected human actors (e.g. students, pupils, teachers, ministers, and so on), sociomaterial studies, by mapping and showing how educational settings are relationally constituted, equally gather the many actors that are required for a practice to sustain itself and hence point to the agency of all of these actors. It could be stated that conceived likewise, sociomaterial description gives a wake-up call to the educational field by *defamiliarizing* what is often considered as familiar: education policy, for instance, not only consists of ministers and policy documents but equally of standards, websites, affected teachers; a university not only consists of lecture halls, professors and students but equally of computers, patents, friends, stories; … As we have argued, the crucial point is not stating that these are important as such, but concretely showing how something is being *rendered* important or obsolete (e.g. a document is important not because it is issued by the cabinet but because other actors relate to it in such a way that it is rendered important). This constitutes a second dimension of this critical capacity: sociomaterial approaches allow for the inclusion of that what is often not given many consideration because it is so familiar, and for showing how these actors are (potentially) truly decisive as well. Conceived likewise, this constitutes not only a critical action, it equally constitutes an educational one in as far as sociomaterial descriptions aim

to give voice to actors that are often not taken into consideration and as such disrupt established ways of looking and seeing.[4]

Third, these descriptions could be conceived as being emancipatory, but again differing from the traditional representational meaning of the word. In this reconceived critical vein, emancipation is not qualified as detachment but rather as going from one *attachment* to the other (Latour, 1999a; 2013). Coming back to the notion of care introduced above, care indeed requires attachment. There is no way to care without being attached to that what one cares about, or to put this differently: 'care is a doing necessary for significant relating' (Puig de la Bellacasa, 2011: 98; also Latour 2004b). The critical capacity related hereto is that such 'matters of care' (ibid.), or such attachments, can be identified in and through sociomaterial descriptions in such a way that what we have designated as a practice might come to the fore: the specific way of doing and relating to specific things that makes that something can be termed as being 'educational'. In other words, sociomaterial descriptions have the capacity to give a voice to that what could be termed as the (proto-)typical *educational* by identifying the different attachments that actors have in educational settings. In times where educational research is under increased societal pressure and under increasing appropriating tendencies of other scientific disciplines, this seems as a highly important and critical task (see also Masschelein & Simons, 2010). The emancipatory act here is then not directed at (detaching) the individual (see above), but precisely at identifying and describing those attachments that make that a practice can sustain itself, for instance, identifying those attachments that are present in a particular educational setting (e.g. an attachment of a teacher to certain norms and values, to pupils, to providing these pupils with worthwhile education, but equally to chalk, books or other objects). This is not achieved by adopting a theoretical, but precisely by adopting an empirical and descriptive vantage point: by deploying a *stubbornly realist* attitude and by assembling different mappings of different aspects of educational settings, sociomaterial

[4] There is a point to be made here that in most sociomaterial studies, such thoughts are often primarily linked to the political realm instead of to the educational realm (see especially Latour, 2004a). We do not have the space to elaborate upon the relations between the two in this chapter, but see Edwards & Fenwick (2015) and Postma (2012).

approaches offer the opportunity to highlight which attachments one cares for and that enable an educational practice to emerge. In doing so, they offer the critical prospect of presenting what it is for schools, universities, families, etc. to *exist* as a school, university or family today (Latour, 2013).

Finally, and ultimately, the critical capacity of sociomaterial studies is situated at the agency of the researcher herself. That is to say, if sociomaterial approaches enable to approach educational settings as relational and composed practices that have a typicality that can and needs to be described empirically, these approaches are also critical in as far as they enable to *recompose* that what is perhaps not too well composed. Sociomaterial approaches, by having the potential to make such empirically informed *proposals* at reassembling what is given today, are perhaps especially well fit to critically intervene in present assemblages or to (re-)shape and (re-)design future compositions so as to shape a more livable common world (Latour, 2004a; b). Perhaps this establishing of a common world is especially an endeavor that educational researchers are largely concerned about and care for themselves – that is, perhaps this is precisely one of their own modes of attachment.

CHAPTER TWO: RELATIONAL THINKING IN EDUCATION TOPOLOGY, SOCIOMATERIAL STUDIES, AND FIGURES[5]

Introduction

Over the last years, different research orientations aiming to investigate both the social and the material dimensions of daily educational practices have emerged. Advocates of these orientations argue that material dimensions of educational practices are all too often ignored, since many conventional educational research tends to exclusively place the traditional human subjects in educational practices (students, teachers, directors, ministers, …) center-stage. Thus, the argument goes, a whole realm of equally important material agents is not being accounted for (Fenwick, Edwards & Sawchuk, 2011). In trying to equally account for this material realm, these relatively recent *sociomaterial approaches* are gradually receiving more interest and adoption of educational researchers (e.g. Landri & Neumann, 2014; Fenwick & Landri, 2012). Being relatively new, a conceptual common ground is emerging but equally seems yet to be found: some studies in the field of education typify themselves as being actor-network theory (ANT) studies (e.g. Fox, 2005; Habib & Wittek, 2007), others as being assemblage studies (e.g. Gorur, 2011; Koyama & Varenne, 2012), still others as socio-technical or sociomaterial studies (e.g. Luck, 2008; Orlikowski, 2007), and so on.

The aim of this second chapter, however, is not to bring conceptual unity in these nomenclatures. Rather than that, we will highlight that, in addition to a focal interest in materiality, a central focus of these approaches is directed at relations. This relational focus is equally adopted by *social topology*, an approach inspired by the mathematical field of topology. Despite that this common relational focus has been

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highlighted by some (e.g. Mol & Law, 1994; Law, 2002a), this topological approach is relatively scarcely adopted in sociomaterial studies (and this especially applies to educational studies). Therefore, this chapter calls for a more intricate interweaving of topological thinking with more well-known conceptual frameworks of sociomaterial studies (e.g. ANT). Such interweaving, we argue, could constitute a fruitful vantage point for a more rigorous understanding and investigating of the relationality within educational practices. Furthermore, we assert that using visualizations might play a crucial role in this respect.

The structure of this chapter is as follows. The first section elaborates the general argument that relational thinking constitutes a common ground of both sociomaterial and topological studies. We start by elucidating this relational thinking, and illustrate what a rigorous application of such thinking entails. Thereafter, we introduce some central tenets of (social) topology. We argue that topology constitutes a fruitful approach in order to apply such relational thinking. Furthermore, we illustrate this argument by means of some examples of educational studies that have already been conducted in this sociotopological vein. This will bring us to the conclusion of this first section, pointing to a distinction that both sociomaterial and sociotopological studies of education need to attend to, namely that there is a profound difference between *stating* that educational practices are relationally constituted on the one hand, and *showing how precisely* this constitution looks like on the other hand. The second section proposes some reflections on how to conduct research in such a relational vein, in such a way that one *shows* the relational distribution (the form) of educational practices. To that effect, it will be argued that topological conceptions of *forms* and *figures*, and concomitant visualizations, are especially instructive with respect to the presentation and analysis of such distributions. Furthermore, we propose some outlines as to how to conceive of such visualizations, especially in relation to both the (aspects of the) realities these figures attempt to present and the text in which they are embedded, and what such visualizations enable to see and analyze. A third and conclusive section offers some suggestions as to what the general potential of adopting relational studies in the field of education might be, namely the possibility of searching for a *mode of existence* that is typical for the particular educational practices under investigation.

Before starting this chapter, however, three disclaimers. First, despite topology's mathematical origin, we largely focus on the applied branch of topology that has been denoted as *social topology,* since this branch is primarily directed at introducing topological reasoning with respect to how to conceive of social practices. Second, this chapter makes use of the umbrella term *sociomaterial studies* in order to characterize the many studies in the field of education that give an account of the intricacies and tight interwovenness of the social and the material in educational practices. Hence, in this chapter, the term sociomaterial studies includes ANT studies, assemblage studies, some branches of educational practice studies, etc. Related hereto, and third, this chapter should not be conceived as being a comprehensive review of the sociomaterial and sociotopological literature in the educational field. Rather, it constitutes a theoretical and methodological argument for a more rigorous application of relational thinking and offers some propositions in order to effectuate research in this vein.

Relational thinking

Traditionally, social theories are primarily interested in the human dimensions of the settings they are investigating and scrutinize these dimensions to a far greater extent than the material dimensions of these settings. Moreover, the majority of studies that do take materiality into account, do this largely by including material objects as effectual elements. Material or technological components are then considered important in as far as they enable or disable certain human actions or in as far as they facilitate or constrain the effectuation of certain tasks performed by a human individual. Hence, in the larger part of contemporary social theories, the inclusion of materiality most of the time amounts to an instrumentality vis-à-vis the conduct of human tasks (e.g. Callon & Muniesa, 2005; Fenwick et al., 2011; Schatzki, 2010; Waltz, 2006). Sociomaterial studies, on the other hand, jointly focus on both the social and the material dimensions of different educational settings in view of researching the active role that both these dimensions play. Often, these sociomaterial studies operate in a relational framework. This relational point of view not only includes both social and material

aspects in analyzing how a practice under investigation is constituted precisely, but equally, and more importantly, states that it are the relations between these different actors that are crucial. In other words, rather than focusing on social and material actors as being distinct entities, relational thinking places the primacy on the prevalent *relations* in a setting. In doing so, it asserts that in order to understand practices, it is important to look at the relations between different actors.

In order to elaborate this argument, relational thinkers often make a distinction between the settings where certain activities take place on the one hand, and the specificity of these settings on the other (e.g. Latour, 2013; Schatzki, 2010). The term *setting* then denotes an arrangement of interconnected (social and material) entities that points to where, for instance, education takes place. This 'where' might be confined to a classroom (as a physical arrangement of teacher, pupils, desks, computer, and so on), but it might equally point to a non-physical arrangement such as the broader realm in which this classroom is situated (as an arrangement of education policy, district welfare, and so on). Relational thinking conceives of both such physical and non-physical arrangements as consisting of relations between actors that give shape to what is being and what can be done. In other words, there is no need for context here anymore, that is, if context is used in an overarching (framing) and/or clarifying sense. Instead, in a relational view 'context' is nothing more than a broader set of relations between very specific actors as well. The district welfare or education policy of a region, for instance, are then not conceived as structuring givens in which a classroom is situated, but rather as a describable assemblage whose relations enable and/or disable particular actions. 'Education policy' is then no big monolith but a specific arrangement of documents, tables, websites, ministers, cabinets, and so on, that relationally gives shape to what can or cannot happen in a classroom setting. In that sense, the *type* of relations is of importance: the relation between a policy document and a teacher, for instance, might be a relation of instruction, but equally a relation of modification or neglect.

Eventually, the relations that are formed between social and material actors in such settings give shape to different *practices*. Practices relate to settings in the sense that they point to the specific spatiotemporal features that emerge in these settings, and that are composed by the

relations between both social and material actors. As such, practices not only pertain to settings, but equally point to the *specificity* of the actors in that setting and to the doings, sayings, activities, understandings and routines that take place in such settings. A teaching practice, for instance, is situated both in a classroom setting and an education policy setting, but – as a teaching *practice* – points to the specificity of this teaching, rather than (only) to the arrangements in which it is situated. That is to say, in a relational vein, 'teaching' is not only the resultant of a web of relations between different social and material actors but equally enacts particular effects that can only be discerned by considering the types of relations that are involved in a certain setting. In that sense, the focus of relational thinking is not only directed to the 'what' or 'who' (what/who is positioned in a particular setting), but also to the *how* and the *where*: How do these relations look like? What is specific about these relations? Where are these to be found? Are there actors that are almost never related to? Are there actors with which many actors nearly always relate? A teaching practice, for instance, might turn out to be specific in as far that there are not only pupil-teacher relations established, but equally in as far that a certain subject (a rock, a newspaper article, …) is being related to by all humans in the classroom setting as something that draws attention and in as far as particular sorts of time and space are enacted. How the sociomaterial actors present in a particular setting shape a teaching practice, is then further exemplified by asking questions as: How do the ways of doing things in a classroom together look like? Where is it that teaching occurs? Which sorts of time and space are enacted likewise? (Mol, 2000; Landri, 2012; Schatzki, 2010).

In posing such questions, relational thinking discards traditional distinctions between agency and structure. Just as agency is never the sole feat of one singular actor, what is conventionally designated as structuring factors (e.g. order, stability) is equally enacted relationally: the 'structure' of a practice is not considered as being there a priori, but rather comes into being as a consequence of the relations between different actors (Latour, 2005a; Nespor, 2004). In that sense, structures are no pregivens, but rather specific enactments of constellations of relations between actors in a certain setting, constellations that make that something comes into being *as*, for instance, stable and ordered. The strong consequence, then, is that such constellations *need to be described*

empirically, instead of assumed a priory.
In sum, relational thinking is centrally concerned with settings in which actors relate with each other, and in which, consequentially, a specific way of doing things – a practice – emerges that is constantly in the making (instead of pregiven) and that can only be unfolded by means of empirical investigation (Fenwick & Edwards, 2010; Law, 2009b). The question then arises how to put these relational tenets to work, that is, how to investigate practices with a relational disposition as point of departure. As stated in the introduction, most educational studies answer this question largely by adopting a sociomaterial framework. However, in the following section we argue that social topology, with its focus on *figures* and *forms,* equally constitutes a promising approach in this respect.

(Social) Topology

In its mathematical origin and in a technical sense, topology is a subbranch of geometry. Both domains are generally concerned with space and with the properties of objects in that space, although they approach this notion of space radically different:

> Geometry (geo-*metry*) has to do with measurement, while topology disregards measurement or scale, and deals only with the structure of space qua space (topos) and with the essential shapes or structure of figures. Insofar as one deforms a given figure continuously (i.e., does not separate points previously connected and, conversely, does not connect points previously separated) the resulting figure is considered the same. (Plotnisky, 2003: 99)

Hence, generally spoken, mathematical topology does not operate within a framework of a fixed set of global (Cartesian) coordinates by means of which to measure a certain space or to (Newtonian) dynamics by which objects move in space. Rather than (or in addition to) that, topology is concerned with space *qua* space. Studying space qua space signifies not approaching space as if it would be contained within an extensive box of underlying transcendent Cartesian coordinates, but rather as being defined exclusively through the intensive features of the spatiality of the figures: rather than considering the size of a figure by means of a system of coordinates, what is important in topology is how the relationships between various points/agents enact a space themselves. Thus,

topologists do not conceive of space as being there already. Rather, space is shaped by its very contents (De Landa, 2002; Martin & Secor, 2014). As far as the mathematical-topological study of figures is concerned, then, the focus lies upon continuity of shapes, as the quotation above illustrates. It is thus that in topology a circle is equivalent to a triangle, or a mug to a donut: without breaking the original figure (that is, keeping the relations between the various point of the figure), one can deform a circle, or a mug, in such a way that one ends up with another shape (a triangle, or a donut). In that sense, the original (circle, mug) and the eventual (triangle, donut) figure are called *homeomorphic*: even though a circle needs squeezing in order to be rendered as a triangle, in topological thinking the circle and the triangle are considered equivalent since they hold a similar relational form (Hinchliffe et al., 2013; Law, 2002a). In other words, topology focuses on if, and how, the form of a figure (that is, the relations between its different points) holds if it is bent, squeezed, etc., and if, and how, in first instance completely differently looking shapes relate towards each other.

How, and why, has this mathematical domain found its way into the social sciences? The potential of topology in the social sciences is mostly made manifest in terms of its potential to think differently about practices under investigation, how these practices are to be studied, and how we conceive about spatial and temporal features in and of such practices. Social topology is thus often framed as an alternative to more traditional spatial and temporal conceptions in social sciences that conceive of space and time as a priori givens. Furthermore, the adoption of topology in the social sciences is not particularly focused on mathematical formulae. Instead, most of the sociotopological field is post-mathematical in the sense that, primarily, a topological way of looking at and conceiving of the specific practices under investigation is being adopted (Martin & Secor, 2014 - but see Sha, 2012). In this respect, relationality (as outlined in the previous section) is the prime analytic lens: social topology studies stress the importance of empirically describing the emerging relations between actors over the absolute size or shape of these actors (e.g. Hinchliffe et al., 2013; Marres, 2012a; Thompson & Cook, 2014). The term 'actor' must be understood very broadly and can be anything, so long as it has an active role – which is

similar to sociomaterial studies: it might be a vessel, a pump, a disease, a human, etc. Michel Serres has made this relational point particularly clear by making an analogy with a ball game (rugby):

> Configurations or fixed places are important when the players don't move – just before the game begins, or when certain established positions are called for at various points in the game – scrimmages or line-outs. They begin to fluctuate as soon as the game begins, and the multiple and fluctuating ways of passing the ball are traced out. (…)
> The ball is played, and the teams place themselves in relation to it, not vice versa. As a quasi object, the ball is the true subject of the game. It is like a tracker of the relations in the fluctuating collectivity around it. The same analysis is valid for the individual: (…) the skilled player knows that the ball plays with him or plays off him, in such a way that he gravitates around it and fluidly follows the positions it takes, but especially the relations that it spawns. (Serres & Latour, 1995: 108)

Serres, an advocate of the introduction of topology into the social sciences, is stressing the importance of relations (passing and movements) here, over and above the actors (the ball, the players) populating a particular setting (the pitch). How do actors place themselves in relation to this 'tracker of relations'? Where do they do this? How does this fluctuating collectivity look like? In trying to answer such questions, social topology heavily draws on topology's concept of *forms* in general and the idea of homeomorphism in particular. That is to say, a central interest of a wide range of ST studies has precisely been how the form of particular settings is being enacted relationally. Analogous to the example of the cup and the donut, ST contends that if two settings retain a same (that is, a continuous) form, they can be conceived as being homeomorphic, transforming themselves from one arrangement into another without discontinuity (Mol & Law, 1994: 664). This is equally reminiscent of sociomaterial studies which also aim to scrutinize the relational distribution of a particular setting, although these studies traditionally do not place particular emphasis on this notion of form (generally speaking about compositions instead – Latour, 2005a). Hence, the general argument that settings are to be studied by means of relations in order to scrutinize the particular form of a practice, is given more emphasis in social topology. Drawing again on Serres's analogy of the ball game, it are precisely these relations that allow for scrutinizing the specific ways of doing things together: Which sorts of (relational)

acting and doing are effectuated? Which sorts of space and time are enacted? Such questions are not primarily directed at who passes at whom, but rather at how any player is positioned in relation to any other player, how this positioning changes over time and how, consequentially, different sorts of time (play time and injury time, for instance) and space (space in terms of lines of attack and defense, for instance) come relationally into being. That is to say, according to social topology relations between actors in a particular setting equally enact particular sorts of space and time, which eventually enables to say something about the specificity of the setting of a ball game practice (Lash, 2012; Lury et al., 2012).

Drawing inspiration from the mathematical field of topology, a sociotopological understanding of space and time differs from linear (chronological) and metric (Cartesian) conceptions that are traditionally deployed in the larger part of the social sciences. In topological terms, time is relational. This implies, for example, that traditional 'singular' objects can be considered as being multitemporal, being the manifestation of a network in which different temporal elements are gathered together: the invention of the diesel engine, patents, new electronic technologies, all assemble together in one singular object that we conventionally call "car" (Serres, 1979; Serres & Latour, 1994). A similar relational approach is made towards space. Law (2002a), for instance, has elaborated upon notions such as regional, network, and fluid spaces, all enacted through the relations between different sociomaterial actors. Depending on the particular distribution of these relations, the same constellations of actors enact different topological spaces. In the example of the rugby game, a space of attacking or a space of defense might be enacted – depending on the relations of the various players with the ball (e.g. a relation of engagement between ball and defender who wants to keep the ball, or a relation of repulsion between the attacker who wants to kick the ball as fast as possible). Even though sociomaterial studies place less emphasis on these spatiotemporal enactments, they are equally reminiscent of topological, relational understandings, in the sense that they also argue, for instance, for a more networked understanding of objects and practices. In sum, both approaches study practices relationally, although social topology does this with a stronger focus on enacted sorts of space and time (Allen,

2011; Deleuze, 1994; Law, 2002a; Martin & Secor, 2014; Murdoch, 2006; Rawes, 2008). In the next paragraph, we shift the focus to the educational field and will, drawing on educational studies that adopt a relational and topological lens, outline how this searching for forms of educational practices is effectuated, and how such research needs to be wary of distinguishing between stating that an educational setting is constituted relationally on the one hand, and presenting how precisely this constitution is looking like on the other.

Topology and educational studies

Most educational studies drawing inspiration from social topology aim to understand educational settings in terms of forms (and consequently in terms of *morphology* – Masschelein & Simons, 2010). Adopting the lens of homeomorphism, and hence aiming to compare and analyze different practices with respect to their respective form and to whether or not these forms are equivalent, seems to be effectuated far less (Nespor, 2006). The (more general) morphological lens has especially been adopted in a field designated as educational *practice studies*, although it is sometimes equally adopted in studies that focus on relational conceptions of space in education (the so-called 'spatial turn' in education: e.g. Beech & Larsen, 2014; Larsen & Beech, 2014). Many practice studies incorporate sociomaterial and sociotopological arguments, in the sense that they attempt to give an account of how the particular form of a practice is constituted by means of a relational distribution of various actors. In a second movement, many of these studies equally stress the specific sorts of time and space and ways of doing things that are enacted (for an overview: Gherardi, 2009; Landri, 2012).

Conceived through a morphological and relational lens, McGregor (2003) accounts of typical *school* forms. For McGregor, what is traditionally called 'school' is not confided to the building in which relationships between various actors (pupils, teachers, maintenance team, …) are enacted – as a traditional view would have it. Rather, it is precisely the other way around: it are the relations between various actors that enact school space, as a specific operation (see also Edwards

and Usher, 2008; Massey, 1994). Noens and Ramaekers (2014) scrutinize a typical *family* form, arguing that a family is not only constituted of traditional actors such as parents and their children, but that there equally are prototypical objects (e.g. a newspaper) and the relations of other family members with these objects, that enact the form of a prototypical family practice. Bayne and colleagues (2014) contrast the typical form of a traditional *university* setting (often conceived as a delineated campus confined by the building it is housed in) with new forms that emerge by means of settings of online distance learning. They show, more specifically, how the institutional form of traditional universities is enacted by distance students, in such a way that not only bounded spatial understandings of the university emerge, but equally other emergent dimensions of university space as they are being enacted in these distance learning settings. Heimans (2012) gives a morphological account of a typical *vocational education and training* form, in close connection with Australian education policy. In this account, Heimans argues that in order to scrutinize concrete implications of education policy measures, one needs to be highly attentive to how such implications take shape in practice, how the material is imbricated herein (and policy, hence, not only being a matter of discourse), and how eventually different sorts of time and space are enacted. Similarly, Thompson and Cook (2014) unfold different topologies of contemporary educational assemblages, such as for instance an *assessment* topology in which global (PISA) flows are deforming the educational assemblage at local level, and analyzing how these different topologies enact different sorts of space and time. Rather than making an empirically informed study, Thompson and Cook make an analytical argument: their focus is not so much on the empirical description of how relations between various actors enact a particular form as on the analytical postulation that the educational field is more and more characterized by global as well as local movements, mobility, change and flows. A similar argument is made by Lingard, Martino and Razai-Rashti (2013), who characterize *educational policy* movements in topological terms.

As useful as the latter analyses are in understanding how educational policies are operating at traditionally conceived local and global scales, these are no longer centrally directed at presenting fine-grained empirical

investigations that take the prime characteristic of social topology, that is, that relations need to be traced and described meticulously, truly at heart (Martin & Secor, 2014). As has been argued by Fenwick (2010b) and Latour (2013), this is more generally equally the case with many contemporary sociomaterial approaches which have been rendered more fashionable recently, but whose adoption is often limited to an application of a sociomaterial vocabulary onto the educational field. As these authors argue (see also Fenwick & Landri, 2012), there is nevertheless a profound difference between *stating* that a practice is sociomaterially constituted (something that merely amounts to stating the obvious when adopting such a point of view) and *presenting*, first, *how precisely* the form of a particular setting is relationally enacted and, second, what would then be *typical* of this scrutinized form. The remainder of this chapter is precisely devoted to these two challenges. In the following section, we argue that in order to present how an educational practice is distributed precisely – this constitutes to a large extent *the* central methodological challenge of studies that adopt a rigorous relational thinking – topology's emphasis on forms and figures might be beneficially adopted. To that effect, we elucidate what a topological approach to figures and forms entails methodologically and in relation to the descriptive texts accompanying it. In the last and conclusive section, we emphasize the importance of equally paying attention to the typicalities of the investigated practices, drawing on Latour's (2010b; 2013) notion of mode (of existence).

Relational research

Data collection: Scrutinizing distributions

As far as methodology is concerned, both sociomaterial and sociotopological studies are centrally concerned with finding ways of observing a setting that allows to analyze the particular distribution of actors in this setting. As varied as these observation methods are, they are all devised in such a way that they are directed at tracing as much actors, relations between actors, and the types of actors and relations, as possible. In that sense, both sociomaterial and sociotopological

approaches do not aim to be explanatory or evaluative, but are in first instance focally aimed at tracing how different actors relate to/with each other precisely (a question pertaining to data collection) in order to present a relational account of these distributions afterwards (a question pertaining to data analysis). As to data collection and well documented over the years, this tracing is largely effectuated by ethnographic means: especially much sociomaterial research adopts an ethnographic methodology in order to understand a setting in terms of the distribution of actors and their relations in a particular practice (see Fenwick & Edwards, 2010, for an overview). As to the concrete design of such ethnographies, however, both approaches are undetermined, stating for instance that one just has to follow the actors and just has to describe – although some attempts at bringing about methodological clarification have recently been made (e.g. Latour, 2005a; Venturini, 2010; 2012). This openness often results in studies in which the researcher starts with following one actor and expands her scope when relations between this and other actors start to unfold (e.g. Ceulemans et al., 2014; Sørensen, 2009). In addition to ethnographic methods, a few other methods are adopted in educational SM and ST studies, all aiming to scrutinize the distribution of actors and relations of the setting under investigation: document (inscription) studies; interviews; analyses of digital assemblages such as websites; etc. (Decuypere, Ceulemans, & Simons, 2014; Gorur, 2011; Thompson, 2012). Furthermore, and at the much less elaborated level of data analysis, recently many visualization tools are being deployed with the intention of presenting and scrutinizing the distributions of the settings under investigation. These tools are often visually oriented, seeking to visualize such distributions of actors and relations (Ruppert et al., 2013; Savage, 2009; Latour et al., 2012). It is to this point that we want to devote explicit attention in the next paragraph: perhaps figures are especially well-suited for presenting how (instead of merely stating that) precisely the sociomaterial distribution of educational practices takes shape.

Data analysis: Figures and texts

With respect to the analysis and presentation of the relational distribution of different settings, we believe that such visualizations, in

addition to traditional textual descriptions, might offer a fruitful contribution: figures offer a possibility to render the (concrete form of the) distribution of actors and relations in a particular setting intelligible. We are using the term 'figure' in a delineated manner, however, in the sense that not each usage of the term will do. More particularly, we use the term in contradistinction with terms as 'pictures' or 'images'. Whereas pictures or images are often conceived as mimetic or representative rendering of what was to be seen in a particular setting, figures have a much more active, non-representational role: figures are *descriptive objects in their own right*, which, as we will argue below, make it possible to analyze a setting in terms of its form (Geerinck, 2011; Savage, 2009). Equally, we are not using the notion of the figure as a metaphorical device: neither are we talking about the figure as a metaphor for personality traits ("he is quite a figure"), nor as designating a particular role ("the figure of the teacher"). On the contrary, we claim that figures, as visualizations that describe, are fruitful tools to analyze the distribution of educational settings in terms of their topological form. Conceiving of figures not as passive representations but as active devices themselves, raises some additional questions with respect to the relation of these figures with the textual body by which they are surrounded: What is the precise relation between a figure, thus conceived, and the text? What is the relation between the textual and the visual? Such queries are not only posing the question as to the agency that visualizations themselves have. We equally thread on reflections about the status of 'the visible' and 'the articulable' here, and concomitant arguments that these two pertain to two different orders (Deleuze, 1986; Foucault, 1983; Savage, 2009).

Deleuze, with Foucault, has argued that the visible belongs to a different realm than the articulable, and that these two can never overlap: there is no conformity between what is visible and what is articulable. Each domain, they argue, acts along its own logic and has different rules. In his studies of discourse and power, for instance, Foucault argued that what we say, that is, day-to-day enunciations, is never hidden, and yet these enunciations are neither directly readable or even sayable: each enunciation belongs to a particular regime, and such regime supposes a delineated manner of making connections between words, sentences and propositions. The same applies to what is visible: the visible is never

hidden, and yet it is neither directly seen nor visible. Rather than that, something is only rendered visible at the moment that there are *devices* (or machines) that shed light on some aspects, in order for something to be rendered visible. That is to say, Deleuze and Foucault stressed the active role the visible plays, and that this realm is of a different *order* than the sayable. Equally, they argued that despite this non-conformity between the two domains, intersections between these domains are sometimes established (Deleuze, 1986; Foucault, 1983). It is at this point, where the visible and the articulable intersect, that what both designate as a *diagram* starts to emerge: a scattered combination of two domains that never overlap, that can never overlap, but where some intersection between the two orders is nevertheless being established. A diagram, then, *'is no longer an auditory or visual archive but a map, a cartography that is coextensive with the whole social field. It is an abstract machine'* (Deleuze, 1986: 34). It constitutes a 'meeting place' for words and images, the main quality of it not being pursuing objectivity but establishing an *optical consistency* by means of which the diagram is presenting a distribution of words and images in such a way that it *presents* the world without resembling it: the map and its markers are not the territory, the graph and its legend are not the laboratory, and so on. Rather, they are optically consistent with it: they have the capacity to look consistent with the world they depict, even though their operations are of a totally different nature (Latour, 1988). A diagram (an illustrated child book, a map with a legend, etc.) is thus a technique, or a machine, that brings the visual and the articulable together; a *display of relations* (Deleuze, 1986: 36). The diagram displays these relations in such a way that it *'never functions in order to represent a persisting world but produces a new kind of reality'* (ibid.: 35). In other words, the relations of the diagram with the world are not to be conceived in terms of passive correspondence, but rather in terms of active presentation, where that what is presented creates something new. For Foucault and Deleuze, the diagram is an active operator and furthermore the technique par excellence in which the two realms come together without ever merging.[6] Hence, the diagram should not be conceived in

[6] This is a rather loose interpretation of Deleuze's and Foucault's theorizings of the diagram. Deleuze and Foucault are centrally interested in the diagram because they consider the diagram as a central place where power is being made.

terms of resemblance (as if the figure and the text would affirm a representation). Rather, the relations that the diagram invokes have to be conceived in terms of *similitude* or what Latour terms as optical consistency. 'It is no longer the finger pointing out from the canvas in order to refer to something else', Foucault says (p. 49). The diagram does not affirm or represent anything. Rather, it *presents* something; offers the possibility to show 'what recognizable objects, familiar silhouettes hide, prevent from being seen, render invisible' (p. 46). But what about the relation between the textual and the visual, then? If the diagram is not resembling the world (and vice versa) but standing in a relation of similitude to it, if figure and text are no longer representing an outside reality but presenting something new, how to conceive of the intersections between these two?

Diagrams and forms

To specify how to conceive of figures in a relational manner, and how these relate to the textual body by which they are surrounded, we adopt the notion of the diagram as a technique that enables to display relations and that brings the visual and the textual together. In what follows, we discuss three different sorts of diagrams that not only outline the sorts of *figures* currently being used in sociomaterial and sociotopological studies, but equally how precisely these figures are made to stand in relation to the *textual body* that surrounds them.

The first is the usage of sketches. In a study of how 'learning' is partly materially composed, Sørensen (2009) makes use of sketches in order to present the distribution of human (i.c. pupils and teacher) and non-human (i.c. a blackboard) actors in a classroom. Sørensen does not make use of such sketches with the intention of displaying/representing what really happened in the classroom that day. Rather, she deploys these sketches as templates that enable to *show*, that is, to *present* the relational distribution of an educational setting. To state that these sketches are accurate representations would thus miss the point entirely: Sørensen's

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Although their reflections are centrally directed at such mechanisms of power, we believe it equally to be possible to deploy the diagram in a more affirmative way and focus on what such diagrams make possible.

intention is not to show the classroom 'as it really was', but rather to deploy sketches as *descriptive renderings* of particular sociomaterial aspects of the classroom that are traditionally overlooked. Furthermore, basing her argumentations on such descriptive renderings enables her to argue that this particular distribution of blackboard, teacher and pupils generates regions in a classroom (that is, a specific sort of spatiality) and enacts different sorts of presence (that is, a specific sort of temporality). In other words, a diagram of sketches and text allows Sørensen to say something about the classroom as a learning *practice* and eventually what is typical about that practice.

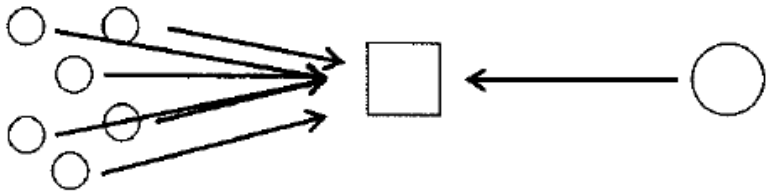

Figure 2.1 Sketch (Sørensen, 2009: 141).

Second, in the two chapters that follow we make use of network visualizations. Especially in the field of Social Network Analysis, the use of network visualizations is getting more and more popular as a representative rendering of the social interactions that took place at a particular point in time (Knox et al., 2006). This, however, is not the usage that we have in mind. Rather, what we are after in the next chapter is searching for ways in which network visualizations are able to present the relational distribution of several academic practices. Equally in this instance, the visualizations used are not considered as some kind of blueprint or X-ray of how contemporary academic life is looking like nowadays, but precisely as topological descriptions presenting distributions of a heterogeneity of actors, or, put differently, as descriptions that present the particular *forms* of different academic practices. These (networked) forms enable to describe the effects that such distributions/forms generate: a network with many centers, for instance, signifies that other actors made many connections with these centers and hence that *authority* was delegated to these centers. That is to say, the visualizations allowed for presenting relational *effects*, such as for

instance that some actors were made important in the course of one day (and not: that these were holding an a priori important position). Similar to Sørensens sketches, in this diagram of networks and text, the relation between the two realms is not directed at the one representing or illustrating the other. Rather, the figures allow academic practice to be rendered visible and more specifically to talk about this practice in terms of its elements, characteristics and the effects of its form in the textual descriptions surrounding the figures.

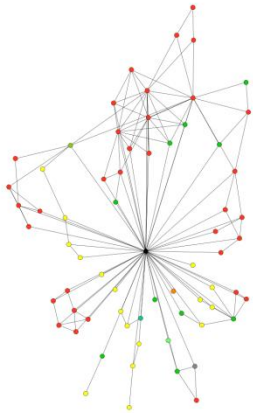

Figure 2.2: Network (See chapter 4).

A third example is the deployment of knots as means for topologically describing educational relations (de Freitas, 2012). de Freitas argues for the deployment of knots as a visualization technique that *'can function as pragmatic* exercises *in finding out how something works'* (p. 594, emphasis added). Such deployment of knots might assist in pointing to aspects that are traditionally more hidden from view – protest, rupture, competing forces, and so on – but are not easily read. Indeed, according to de Freitas visualizations act as descriptive and experimental *exercises*, that is, not as mute renderings of reality as it is, but precisely as presentative renderings that might bring about some insight (or not). As with the two previous examples, these knots thus do not serve a representative purpose but rather try to *present* something in a manner that makes it challenging to read them. What do they allow to see? How

to render them intelligible? Such questions are, according to de Freitas, no shortcomings of these visualizations but, on the contrary, integrally part of the descriptive exercise that takes place in the surrounding text of the diagram.

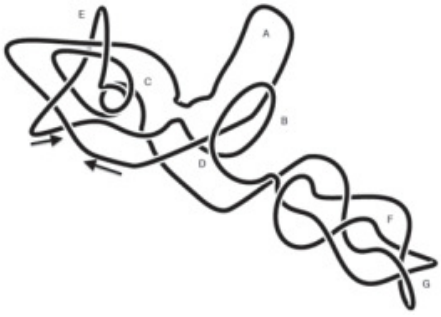

Figure 2.3: Knot (de Freitas, 2012: 567).

In sum, these three examples, all three positioned in the sociomaterial and/or sociotopological field, deploy visualizations in a presentational (rather than a mimetic) and topological (rather than topographical) manner. The figures in these examples present the distribution of actors and relations (the concrete *form*) in a particular educational setting and serve as tools which allow for rendering the relationality of different practices intelligible. As such, these figures can be conceived to be strict applications of relational thinking: they have no other aim than to present a topological distribution. Conceiving of diagrams likewise offers opportunities for scrutinizing how *practices* are enacted, that is to say, what typicalities are present in a particular setting, which sorts of space and time such setting enacts, etc. The following section presents some techniques that might be adopted in order to compose such diagrams.

Composing a diagram: Ocular and writing techniques

As argued in the previous paragraph, topologically conceived, figures present the relational distribution of an educational (i.c., classroom or academic) setting, but have no intention of faithfully resembling or representing that setting. Rather, they *present how* these distributions are relationally constituted and are, because of this presentational capacity,

beneficial in rendering the enactments that such distributions generate (e.g. enacting different sorts of presence, actors being enacted as authorities, rupture, protest) intelligible. As such, they have to be conceived as active devices themselves that not only present a visual account of a setting to the viewer, but that equally challenge the researcher to give an adequate textual account of these forms and the effects they generate. This combination of an adequate textual and visual account was called a 'diagram'; an device by means of which the visible and the articulable intersect. With respect to the *visible*, Illich (1995) conceptualized such challenges as in need of a topological *training of the eye* and the adoption of tailored topological *ocular techniques*. de Freitas, by designating knot diagrams as being exercises, hints to something similar: what these figures show, is not self-evident but needs to be looked upon and reported about in a highly specific matter. That is to say, a training of the eye is needed that allows the researcher to treat such figures not in a relation of passive resemblance, but precisely in an active device relationship: what do they (enable to) show? Where to look, and looking for what precisely? With respect to the *articulable*, Latour (2005a; Latour, Harman & Erdélyi, 2011) conceives of such challenges as the writing of an adequate account and how this writing always necessarily entails an experimental attitude in the sense that we mentioned previously: 'writing' constitutes the laboratory of the social scientist and requires tinkering, experimentation and protocol (one might say: a training of the hands). Then again, questions arise: how to write an adequate account? What to write, and where?

Although there are no unequivocal answers to such questions, social topology offers some assistance with respect to the analysis of forms. Figures as the ones presented above, that present the relational distribution (the form) of a certain educational setting, could then be considered as ocular techniques that enable a relational gaze and that allow to look in specific manners. As such, these figures, as ocular techniques, allow to analyze different dimensions of different settings (a sketch is not the same as a network or a knot). Network figures, for instance, allow to analyze *boundaries* (e.g., between what is included and not-included in the network) and how such boundaries might move, stretch, expand, shrink or break (Mezzadra & Neilson, 2012; Hinchliffe et al., 2013). In other words, figures enable a relational gaze and train the

eye topologically in the sense that they allow for raising questions as: What do boundaries divide precisely? Are these boundaries rigid, or are there actors and/or relations that are not contained by such boundaries? This situates analyses of settings at the level of how they are possibly contained in or constrained by certain modalities or sets of relations of a setting. Other analyses that such figures allow are analyses of *regions* (the upper versus the under half of a knot, for instance). Topologically conceived, regions point to connected and relational spaces in which different actors relate with each other. Visualizing such regions affords the possibility to relationally consider which actors relate with which others, and thus to give an account of what is precisely important in the conduct of a particular educational practice over and beyond singular actors: By which regions is a particular educational practice characterized? Are regions related to each other, and if so, how precisely? Are there actors that are capable of mobility between different regions (Latour et al., 2012; Law, 2002a)? Related hereto are analyses of settings with respect to their *infrastructure,* as the type of actors and relations present in a setting that allow that this setting is able to 'function'. This is for instance what sketches allow, by enacting a relational gaze that assists in pointing to the spatiotemporal effects that a blackboard generates: Which infrastructure is present in a particular educational setting? How does this infrastructure sustain this setting? (see also Mathisen & Nerland, 2012). In sum, the questions raised in this paragraph are challenging ones and not easily answered, yet they are both more easily raised and answered when visualizing and analyzing figures that present different forms of various educational settings.

Eventually, raising such questions allows to say something about what such settings enact precisely. It is on this point that writing techniques come into play, techniques that allow to give a relational account of the visible in the diagram. How to write? Again, this question has no straightforward or unequivocal answer. In any case, this writing is not only a matter of describing what one sees, since the figures themselves are already to be conceived as descriptive objects in their own right. Rather, the central challenge of writing in a diagram amounts to composing a text with the intention of letting a *practice* emerge out of a particular *setting*: the way in which the distribution of actors and relations enacts particular ways of saying and doing things and the way in which

particular sorts of time and space are enacted. More often than not, existing concepts are not always appropriate. Instead, terms that are used in a diagram need to give an account of a particular setting without trying to explain. Therefore, they often need to be tailored to the setting at hand and are consequentially difficult to transpose between different studies (Latour, 2005a – see also chapters 3&4).

Concluding: On educational modes of existence

After having adopted such relational inquiries informed by both sociomaterial and sociotopological approaches, where does all of this lead to? As we have already hinted above, in any case it does not suffice to merely state that educational practices are sociomaterially or topologically constituted. Indeed, if one adopts a SM or ST approach, this only amounts to a generic point that can be made of each and every practice (Latour, 2013). But perhaps neither does it suffice to present how an educational practice is relationally constituted. In this last section, we argue that the ultimate potential of relational thinking is situated at searching for a *mode* that is typical for the setting under investigation (a classroom, a higher education institution, a family, etc.). If a SM/ST view holds that it is not particularly fruitful to fix any a priori boundaries between educational and other practices or between different educational practices themselves, this is an *analytical* point of departure. In other words, both a sociomaterial and a sociotopological view do not assert that there are no differences between different practices (that might be the case, but this is never assumed a priori – neither is the contrary), but rather that what is *typical* about a particular practice is only to be found at the end of a concrete empirical study. In that sense, the ultimate goal of deploying SM/ST studies in education is situated at finding the appropriate words and figures in order to designate what is typical about the educational practice under investigation (a family, school, higher education, university, … practice) and perhaps equally to designate what is typical about education as such. This endeavor goes way beyond a 'showing how'. Rather, we designate this as a searching for the *mode of existence* of the practice one is studying: this might be the mode of existence of a school, a family, a university, and so on.
With the term 'mode of existence', hence, we designate these typical

types of actors and relations between actors in a studied practice; the quality and specificity of the activities in question; the typicalities that might be common to these different educational practices (Latour, 2010b; 2013). This can only be done at the end of a study, when considering the form of a particular educational setting and the prevalent enactments that point to it being a practice. At that point, it becomes possible to state something about these typicalities, that is, about which actors are necessary for a particular practice to be able to sustain itself and more specifically, about how these actors typically *relate* to each other in first instance, and in second instance about which *type of continuity* (if any) is specific to the investigated practice. Such matters refer to what was, at the beginning of this chapter, called *homeomorphism:* What are typical school forms? What are typical family forms? What are typical university forms? Where are these to be found? How do they look like? Such questions pertain to (regional) ontologies in the field of education: what does it mean to be a school, a family, a university nowadays? In order to answer such questions, which hint at the specific mode of existence of the investigated school, family, and so on, one needs to consider the typical associations of such forms (ibid.; Mol, 2000). Certainly, answers to these questions will always to a minimal extent be bounded to the setting one has investigated. In that sense, a searching for a mode of existence of the school, for instance, is not to be considered as having a generalizing aim, but rather argues that there are different ways to exist as a school or university – i.e., different practices – that pertain to a similar (homeomorphic) school or university form: a mode of existence. Yet, it is precisely in trying to answer such questions that a furthering of relational (sociomaterial and sociotopological) studies of education might lay: in offering concrete proposals as to what precisely constitutes a school mode, a family mode, a university mode and, eventually, an *educational* mode of existence (see also Masschelein & Simons, 2013b). Combining sociotopological with sociomaterial insights seems especially instructive: What is a school when approached in terms of form? Are there typical human and non-human actors, or combinations of typical actors populating a particular school? Which boundaries are solid, which more permeable in a family? Is there an infrastructure that typical academic practices share? Such are, we think, very pressing questions, especially in times where many educational

practices are increasingly being claimed by other modes of existence, be they political, psychological or economic. If educational research (still) wants to inhabit a mode of its own, that is, being a research domain that is not usurped by other social-scientific (political, psychological, economical, etc.) ways of conceiving what education is, can, or should be, perhaps it makes sense to state that such an educational research domain and the way it exists in the broader research field, should aim to empirically present what is typical about an educational setting, and hence, what educational practices are characterized by precisely. This could allow for sustaining, perhaps reinventing, a specific mode of existence of educational research itself, that would not content itself with pointing to such typicalities but that would, equally, offer *propositions* so as to recompose certain settings and render them an educational character. Perhaps, then, it might make sense to first of all scrutinize contemporary educational practices in search for modes that qualify it as a distinct, and hence in first instance non-appropriable, given.

CHAPTER THREE: ON THE COMPOSITION OF ACADEMIC WORK IN DIGITAL TIMES[7]

Introduction

Over the last two decades, a sense of awareness has arisen that universities are both experiencing and facing important challenges. This certainly applies to the academics inhabiting these universities, and especially since the advent and proliferation of digital technologies and devices. It has been argued that many facets of the professional life of academics are increasingly rooted in digital technologies nowadays (Illich, 1991; Peters, 2006; Robins & Webster, 2002; Weller, 2011; McCluskey & Winter, 2012). Research dealing with the digitization of the academic profession is often directed towards a contextual rendering of how digital technologies and devices have a general *influence* or *impact* on academic work. Common assertions in this respect are for instance that the academic profession is being more and more networked or that it is less and less bound to a particular physical location (e.g. Kuntz, 2012; Weller, 2011). Such contextualizing approaches make an analogous move compared to approaches that try to explain academic functioning through other underlying grand processes and factors that are considered its prime movers (e.g. marketization, privatization, globalization – Calhoun, 2006; Herbert & Tienari, 2013; Kim, 2009; Readings, 1996): in one way or another it is argued that these evolutions are the main factors that have an impact on the academic profession.

The subjacent rationale adopted in many of these approaches is that such

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'grand' evolutions directly alter daily academic work: being conceived as 'input', they are deemed to clarify how the resulting 'output' (academic work) is looking like today. As such, these approaches have little focus on what is happening exactly in academic practice, how academic work is precisely composed, and how digital technologies (amongst other components) give shape to academic practice. It is this *composition* of academic work that remains largely a 'black box' (Latour, 1987). That is to say: by considering academic work (as output) as something that is influenced or (partly) *made* by particular processes (as input), what is given little attention is how academic activity is being composed on a daily basis and how digital devices play a role in that composition. In this chapter, we adopt another approach that precisely tries to get grasps on how such composition looks like. This approach considers the phenomenon of 'digitization' not as a directly influencing input matter, but rather on the contrary as something that could be revealed (or not) after the conduct of a study with respect to the components that make up academic practice.

The structure of this chapter is as follows. In the first section, we give the floor to the theoretical approach that informed the actual study: Actor-Network Theory (ANT). ANT can be termed as a relational sociomaterial approach that focuses on both human and non-human agents in particular practices and that investigates empirically how these different agents assemble into (actor-)networks. Based on this theoretical approach, in a following section we introduce the methodological and analytical approach and the concrete design of the study conducted. This design consists of a detailed analysis of one academic practice that will be reported of in a following section by means of an account that is both visual and written. The use of visualizations in the conduct of an ANT-analysis was a focal point of attention in the present study. Not only was it our purpose to investigate the composition of academic work; we also wanted to explore the possibility of conducting a sociomaterial analysis both textually and equally based on visualizations. The construction hereof is the subject of the third section. In a last conclusive section, we coin the results of this study to some more general literature regarding current evolutions concerning the university in general and (the role of the digital in) academic life in particular.

Theoretical approach: Actor-Network Theory as sensibility[8]

In this section, we introduce the theoretical appraoch that informed this contribution: Actor-Network Theory (ANT). This will be done by relating ANT's key ideas directly to the central perspective of this chapter, that is, the composition of academic work in times of digitization. In other words, it is not our intention here to give a full-fledged account of 'the theory' of ANT, but rather three guiding principles that were central in the conduct of the present study. These principles are often designated as *sensibilities*: rather than being a stable 'theory' as such, ANT is more of a fluid approach that focuses on phenomena in the making and that requires some specific analytical dispositions (Fenwick & Edwards, 2010; Law, 2009b; Mol & Law, 1994). The three sensibilities that will be discussed here are sensibilities directed towards 1) heterogeneity, 2) relationality and 3) enactments.

Heterogeneity

In the analysis that follows, no *initial* analytical importance will be placed regarding (distinctions between) more traditional analytical concepts such as the human and the non-human, the social and the material, etc. That is to say: studies in line with the ANT-approach assume as little as possible before the actual conduct of a study. Instead of adopting these traditional concepts, ANT-studies focus on the processes by which different actors of all sorts come together and on how this 'coming together' is being established precisely.

This implies that the focus/sensibility of this study is directed to the agency of these different actors which are all treated as belonging to the same analytical plane: Which interactions are being established? Which

[8] Readers that read this dissertation as a whole, will encounter a slight amount of overlap with the first chapter in this section. Furthermore, the terminology adopted here is centrally revolving around ANT (instead of around sociomaterial approaches). This is one of the points at which the vocabulary used switches somewhat (as mentioned in the introduction, and largely due to our general attempts, at the moment of writing this chapter, to effectuate a rigorous application of ANT).

actors (human as well as non-human) are involved in these interactions? By considering classic foundational categories (e.g. 'the academic', 'the digital', etc.) not as point of departure of the actual study and by focusing rather on the processes by which different actors of all sorts come together, this chapter highlights the interconnectedness of many activities (Fenwick & Edwards, 2010; Law, 2009b). This implies that the focus is on the identification of all things and people that make up academic practice and on the activities that are performed without making prior judgment regarding to what matters most or what underlies 'what'. In other words, the study reported of in this chapter emphasizes the heterogeneity of academic practice: consisting of a varied range of different actors whose differences in possible impact or role do not matter at the outset, for each actor was analyzed in the same way.[9] Latour (e.g. 2005a) hinted a couple of times at replacing the more human-centered concept of 'actor' with that of the more agency-reminiscent term 'actant' so as to avoid suggesting a conceptual human-centeredness. The term 'actor', however, seems to prevail in the literature. In what follows, both terms will be used interchangeably and as synonyms.

Relationality

Based on this first sensibility, it could be assumed that the project of ANT-studies is to unfold the heterogeneity of actors and how these different actors coexist in everyday life. Such assumption would, however, refrain from taking into account two more sensibilities that are equally decisive in pursuing an adequate ANT-account. 'Relationality' is the second sensibility that guided this study. That is to say: we took as second point of departure the view that agency is neither a characteristic of one particular (human) actor nor explained by looking at one singular actor or factor, but rather distributed and located within the webs of

[9] This callousness towards the ontological status of actors in favor of a single-minded focus on heterogeneity of different actors possessing agency has been designated as *generalized symmetry*: each part of the traditional fissure between humans and non-humans is being given equal analytical consideration (Callon, 1986; Fenwick & Edwards, 2010; Law, 2009b; Murdoch, 1997).

relations within which each actor is located, viz.: that all things are what they are in relation to other things (Law, 2009b; Gad & Bruun Jensen, 2010). To take a simple example such as a printer: it is only in the relation of a printer with other actors (paper, secretary, computer network, files…) that this printer can actually work, and hence, it is not sufficient to look solely at this printer in order to understand its agency. ANT studies often speak about such webs of relations between heterogeneous actors in terms of *networks*, or what is sometimes equally called an *assemblage*[10]. In other words, upholding this relational sensibility implies seeing both actors and networks as being constantly transformed by relations vis-à-vis other actors and networks (see Callon, 1986; Latour, 2005a). The central aim of this study, then, is to find ways to understand and describe academic work not by analyzing the agency of the academic (alone), but on the contrary by focusing relationally on how different human and non-human actors are enacted within webs of interactions and on how and what kind of agency is distributed within these webs (Callon & Muniesa, 2005). In this study we analyze the distribution of agency by looking, first, at the level of actors and *interactions*, that is, at all sorts of human actors and things, and at the way they interact. This mapping allows to focus on different *operations* in academic practice, that is, on a description of what happens (e.g. composing text, doing calculations…) in a clustering of actors and their interactions (e.g. a clustering with respect to grading students). In line with the topological language of webs and networks, we will use the notion of *region* to distinguish and describe several clusterings that unfold when academic practice is described in terms of actors and networks. The notion of *operational effect* is used to describe the effect of operations that make up or compose a region. With the notion 'effect', we want to stress that we do not want to understand or explain academic practice by focusing on it functions or goals, but rather by looking at emerging

[10] This relational view is made intelligible maybe most clearly by pointing to the full reversibility of the statement that networks consist of actors. Indeed, according to ANT, an actor is also, always, a network itself – hence the simultaneous usage of the terms and the hyphen in *actor-network*. Each network is fully defined by its actors and the relations that are formed, but this also applies the other way around: each actor is fully defined by the network in which that actor resides(Latour et al., 2012; Law, 1992).

mechanisms. In sum, what academics are doing on a daily basis will be described in terms of several regions of operations they (and several other actors) are engaged in, and on the effects of these academic operations.

Enactments

This study, being centrally concerned with tracing which actors act in a particular situation and with how (if) these actors relate towards each other, is centrally interested in what could be called 'the emergent'. The focus of the account that follows lays upon academic *practice*. When using the term 'practice', we designate something that is emerging/in the making, rather than being 'made': the term practice refers to things that happen and that are made to be happening by several people and by lots of things. The term 'practice', by pointing to that what is in the making, thus designates the multiplicity and the complexity of relations and related operations and how they appear in their emergence (Mol, 2002). By conceiving academic reality as becoming/emerging, this study shares with other ANT-studies the conviction that each practice is assembled (Latour, 2005a; Law, 2009b), and hence that each assemblage is a momentary state of what we termed operations and regions. Academic operations and regions hence are always in the making. The implication hereof is not that each region, with its operations, would be necessarily disconnected from other regions and their operations. On the contrary, ANT-studies, sometimes designated as doing 'sociologies of associations' (e.g. Latour, 2005a), are equally concerned with how different regions might share some mutual actants. The example of the printer is again instructive, for it could be expected that this device is part of, or rather enacted within, several operations such as for instance grading students or reviewing literature. The study of these *associations* of regions is then often looking at those actors in an assemblage that overlap with other assemblages, and that hence, in a certain sense, reside on the border of two (or more) regions in an academic practice. In line with this perspective, it is important to stress again that we describe an academic practice not from the viewpoint of the academic, but instead consider the academic – in what he or she is doing and relating to – to be part of a

practice of operations and regions in which he or she, together with other actors, is engaged (Mol, 2002; Moser, 2008).

In summary, relying on these three sensibilities, we attempt to describe the composition of academic practice in the making on a relational plane, and thus by taking into account the agency of both human and non-human actors, in three steps. First, the *constitution* of the actor-network will be discussed: how do actors in academic practice establish interactions, and how are they themselves established by their interactions? After having described this constitution,, in a second step we will answer the question of distributed agency in the constituted practice: how is academic work *distributed* in larger wholes, that is, what are the regions and their operations that make up academic practice? The focus is on sets of distinctive operations and their effects; operations and effects that can be identified when looking at academic practices in terms of an actor-network. In a third step, the *associations* between the described regions will be discussed. That is to say: in this third section, we will analyze whether or not different regionalizations are related towards each other and, if so, how precisely. Before engaging with these guiding questions, we will first highlight our methodological and analytical approach that consisted of conducting and analyzing interviews in a distinctive way, and that had specific implications for how our described accounts were constructed (both textually and visually).

Methodological and analytical approach

Upholding the sensibilities above has consequences with respect to how to conduct research and with which methods and analytical tools to conduct this research (Latour et al., 2012; Landri, 2012). A first consequence relates to the *mode of description* and more particularly to how precisely to describe academic practice relationally. A second consequence pertains to how to *collect data* and more particularly to the conduct of investigating academic practice. A third consequence relates to the *mode of analysis*, and more particularly to how precisely to analyze the data collected. As will be made clear, this study experimentally tries to explore the potential of introducing visualizations of sociomaterial assemblages in the conduct of actor-network studies. Using

visualizations not as mere illustrations but as integral part of the present study, is an analytical technique of which the importance has been recognized recently, but that has been used only very scarcely up to now (and certainly in the field of educational research) (Latour et al., 2012; Marres, 2012b).

As far as concrete investigation is concerned, Latour (2005a; see also Venturini, 2010; 2012) has summarized the methodological project of ANT as a call for closely 'following the actors' in daily concrete situations and for sticking to 'description' instead of searching for overarching explanations. This focus on and closeness to practices is reminiscent of traditional ethnographic research in the sense that both share an emphasis upon everyday actions, activities and behaviors of (both human and non-human) actors. Both the actor-network and the ethnographic tradition consider practices to be thick and are conceived as heterogeneous assemblages composed of and encompassing many-layered actors, relations and associations between these actors (Nimmo, 2011; Prabhala, Loi & Ganapathy, 2011; Sørensen, 2009; Westbrook, 2008). This notion of thick description should not be adopted only in the sense of being highly attentive to details. It also pertains to the *style* of the descriptions, for "Thickness should also designate: 'Have I assembled enough?'" (Latour, 2005a: f.192). In line with these thoughts, one can rely on the classic notion of thick description as far as one understands 'thick' in a specific way: as referring to the following, or tracing, of every one and every thing in their course of action. These sorts of descriptions are then less 'in depth' (and including contextual information) but more flat, taking concrete actors and actions (in their relationality) as point of departure (Geertz, 1973; Pole & Morrison, 2003). These notions of thick and flat description do not preclude the fact that what is described needs to be conceptualized, or to say this otherwise: that an adequate account of what happens in a specific situation needs to be given. In order to compose such adequate accounts, ANT-studies have provided a whole series of what could be called quasi-concepts: *concepts* because they try to offer an account of what happens in a particular situation, *quasi*-concepts because these concepts do not jump towards the level of providing explanatory generalizations and do not radically impose some kind of metalanguage on the language used within the described practices themselves. Examples are: obligatory passage point (Callon, 1986); center

of calculation (Latour, 2005a); etc. These already existing quasi-concepts might be useful in constructing one's own description, yet very often new quasi-concepts that fit better to the situation at hand need to be introduced in order to arrive at such an 'adequate account' (Latour, 2005a). In what follows, we will engage in this kind of quasi-conceptual work when it comes to giving an account of the operations, the regions and the effects that are part of the composition of academic practice.

In order to be able to describe academic practice, we first of all had to find a way to follow the actors populating this practice (Czarniawska, 2007). It was our supposition that this would require a particular research design. Traditional direct observation of academics in interaction with other actors, such as for instance digital devices, would prove to be difficult. We were particularly doubtful whether direct access to computer activities (e.g. who is skyped or e-mailed with, which websites are visited, etc.) would be granted – especially considering that, in many cases, these devices are being used for both personal and professional purposes. In order to avoid this privacy issue, another way was sought so as to gain a detailed look at and to trace the activities that were performed in academic practice. We interviewed six professors (different countries, universities and fields of research) about the course of their previous working day, focusing not so much on the *contents* or *meanings* of activities that were performed that day but rather on the *actors* and the *relations* that were involved in these activities. Due to the experimental nature of the analysis that follows, in this chapter we limit us to the presentation of one interview and focus on the exploration of adequate textual and visual accounts. The interview that will be reported of was conducted with Mary, a professor in the field of bio-engineering. In order to focus on the level of actual interactions, the interview was reminiscent of a *hearing* where she was asked to report on every detail of what she did the previous day. This was being done in a highly accurate manner, from the moment of waking up until the moment of going to sleep. For instance, if the respondent said she was writing a paper, the focus laid upon with which device, with which software, with the assistance of which books, and so on, rather than on the particular content of the paper or on the (feelings, meaning-giving of the) person writing this paper. This led to a lengthy conversation (1,5h) in which many small and short questions (rather than grand questions about

particular topics or phenomena) were asked, such as for instance in the following interview excerpt, which reports of a rehearsal of a student's thesis defence:

> - The presentation was still very minimal. So actually, we first remade the presentation together.
> **- For the defense?**
> - For the defense. And actually, they [the students] did not do a defense yesterday, because the official defense was planned for today.
> - **Today was the defense, okay.**
> **-** Yesterday was… hmm… Because I am a promoter of these students, I always give them the chance to rehearse once. To see them in advance. But in fact, we have been tinkering more with the presentation than that they have been rehearsing their defense.
> **- And in the meantime, hmm, I am trying to imagine all of this; was this projected?**
> - The meeting took place in the meeting room downstairs, and there is a beamer over there so that one can always project on a wall. The only thing to bring yourself is a pc. So, I brought my pc and we were just sitting at the table and we could look.
> - **Whilst the student was presenting?**
> **-** Actually, during the period that we discussed the slides. And eventually, we have adapted the slides together. Uh… I have given them slides from other presentations that I had modified, so that they could withdraw things from these slides for [their defense] today. And this meeting took place until… Well, I had another meeting at half past three. But I was eleven minutes late. *(laughs)*
> - **Eleven minutes?! *(laughs)***
> **-** Yes, they pointed to my eleven-minute delay, that's how I know. Hmm, that meeting took place in my office, but not immediately, because… Yes… in the meantime, one of the persons was engaged in a conversation with another person and… thus… I think the meeting took place at about quarter past three.
> - **And in the meantime?**
> - In the meantime, I did some research about a conference I attended two weeks ago. I heard something there that seemed interesting for one of the research projects, so I had to look up a patent and some articles that were pointed to there. I have been searching, printing, and looking at these articles.

As this excerpt illustrates, the conduct of interviews as a kind of hearing was used as a (more indirect) alternative for participant observation in cases where such observation is not appropriate or feasible. Slightly inspired by the more well-known interview to the double, where respondents are asked what a double of them would have to do in order

to function normally during the course of a working day (Nicolini, 2009), the interviews were then treated as observer notes that try to articulate and re-present academic practice by departing from all actors and interactions performed the previous day. In that sense, we did not add interpretations to the interviewees' responses but rather adhered to their *infralanguage* by means of not adding any explanatory or contextual elements to the things each academic said (Latour, 2005a, but see also the elaboration of the notion of quasi-concepts above).
In summary, the interview transcripts served a double finality. First, the interview aimed at obtaining access to the level of actors and interactions, and that served as an input for the data analysis and visualization in the next research step. Second, the interview also allowed to obtain access to the context and infralanguage of academics, and this knowledge was also used as a companion that assisted in the description of academic practice of which we will report in what follows.

Constructing visual accounts

Recalling from the ANT that every-thing and every-one might possibly be an actor, as long as this actor leaves a trace and hence inter-acts with another actor, a first step in the construction of textual and visual accounts consisted of a study of the transcript for *actors* that were mentioned. Precision and high level of detail were of primary importance in this respect. Actors were withdrawn from the interview on a scale as small as possible and as distinct as possible. For instance, if the interviewee mentioned that she used a software program on her computer, 'computer' was not used as the description of an actor. Instead, the program (e.g. MS Word), or, when mentioned by the interviewee, the (sub-)function of the program (e.g. the mailing function of MS Outlook), was enlisted as being an actor. Especially when computer activity was concerned, the challenge was to unfold this assemblage in such a way that 'black boxing' was avoided (Latour, 1987). As far as the *interactions* were concerned: an interaction was registered

each time some kind of action occurred between two (or more) actors.[11] This process of data coding resulted in 84 actors and 200 interactions.

In a following step, the thus obtained actors and interactions were manually entered in a network visualization program called Gephi (www.gephi.org; Bastian, Heymann, & Jacomy, 2009). Gephi allows the visualization of actors (*nodes*) and the interactions between these actors (*edges*) in a flexible network structure where the user of the interface can design a network according to her own criteria and according to a variety of different kinds of lay-outs and parameters. Compared to other similar software, Gephi is conceived by its makers to be a tool focusing primarily on visualization, rather than being (only) a mathematical framework on which all parameters and lay-out options should be modeled (Jacomy, 2011). Gephi is hence a software tool that can be deployed for adopting a relational gaze and for investigating which actors actually interact and which do not interact (directly), without having to assume that the program imposes any other underlying structure or reality to the findings than bundles of actors based on interactions (Knox, Savage & Harvey, 2006). Gephi however includes features which are directed at the visual description of the graph and that can be adapted by the user of the program. The actor-networks that will be presented in the following section were visualized according to following features:

- The overall shape of the network was set using Gephi's ForceAtlas algorithm (Jacomy, 2011). The idea behind this

[11] In this study, the focus was on what might be called the *direct context of interaction*, i.e.: the actors designated by Mary as actors she interacted with directly. For instance, if the interviewee mentioned that she used a laptop, but not that she used this laptop whilst it was being charged, the charging cable was not mentioned as an actor, since this cable did not belong to the direct context of interaction. This hence concretely implies that the actor-network only mentions these actors that Mary herself stated as having interacted with directly. This decision to "cut" the network at the borders of the direct context of interaction might then be considered as a rather abrupt stopping of the process of assembling actors and interactions. However this might be true, the decision to cut the network someplace is an inevitable decision which always brings along some sort of premature closure: one can always extend the network further (Strathern, 1996).

algorithm is that connected nodes attract each other, whereas non-connected nodes are pushed apart. This implies that actors visualized close to each other are (relatively) directly connected, whereas actors that are positioned distant from each other are (relatively) indirectly connected – this last point meaning that there is no direct connection between two actors, but only a 'path' of different actors and interactions to be followed in order to obtain some sort of connection between two actors. As stated above, in what follows, attention will be given to clusterings of actors and activities, rather than to paths of otherwise not directly connected actors. These force-based clusterings are then not based on the *intentions* of actors or on the *kind* and *contents* of these interactions, but rather on the intensity of interactions with other actors. By performing specific (force-based) operations on the actors and interactions entered, Gephi visualizes *regions* of actors and interactions that tend to interact intensively with each other and hence allows to focus on the agency within these regions. In other words, instead of looking at academic practice from a priori domains of actions, Gephi visualizations allow to construct regions of actors based on the intensity of their interactions.

- The thickness of each separate node is related to its degree of connectedness: the more an actor interacts with other actors, the bigger its size.
- Once all entered into the database, it is possible to show or hide particular selected actors and interactions in the overall network. In the following, at times we have chosen to include or exclude particular actors as a deliberate strategy that is part of the network description (see Figure 3.3).
- A vector graphics editor (Inkscape) was used in order to stress a particular region of the network by encircling/highlighting it (see Figures 3.2-3.3).

In the next sections, the resulting textual and visual accounts will be presented. As already stated earlier, this will be effectuated by complementing visual with written descriptions in three steps: the

constitution of academic practice in terms of actors and interactions, its *distribution* in terms of regions, operations and operational effects and finally the *association* in terms of relationships between regions in academic practice.

Textual and visual accounts of academic practice

Constitution: Coexisting actors

The first visualization consists of a graph rendered by Gephi and displaying all actors and interactions. In this figure, we can see different actors of different sorts: Mary herself, pieces of software, colleagues and other co-workers, patents, paper, transportation vehicles, texts, different log-ins, communication devices of different kinds, and so forth.

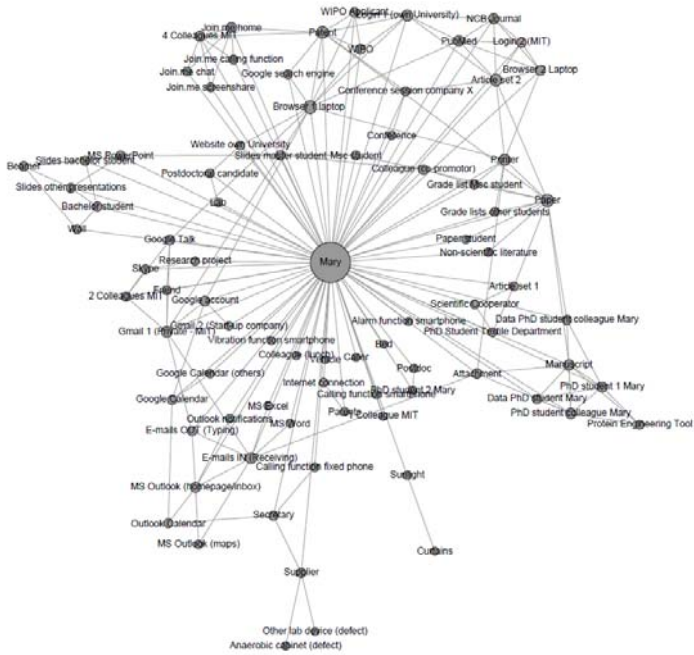


Figure 3.1. Actor-network of Mary's course of the day.

We can immediately see that the actor-network depicted in Figure 3.1 has a high (visual) density: the network does not fall apart in different islands which are totally separate from one another but is rather connected throughout. How to read this visualization? One could start with picking a random actor that can be found on the map, e.g. the actor patent. It is situated on the top of Figure 3.1 and connecting with a couple of other actors. What is it doing there? Following the edges displayed, it can be seen that this object interacts with Mary herself: she is the one who searched for this particular patent. It is at this moment that other attributes start to spread rapidly: the patent was mentioned in a textual account of a conference session that Mary attended some time before. The patent database of the World Intellectual Property Organization (WIPO), from which the patent was retrieved, is situated somewhere in cyberspace and regulated by means of WIPO's applicant. To find this applicant and the concomitant patent, a web browser was used. Not only a web browser was needed to retrieve this patent, however: by means of a search engine and a login granting access to the desired information, the patent could be retrieved. This retrieval led to a further passing on of the patent in the form of a string of signs (either a patent number or a hyperlink) that was then transferred by the program Join.me to four colleagues of Mary who are living and working in the United States. Spreading out rapidly, we can start to see how the interactions of a particular actor define what that actor is, does, and can do. Or stated otherwise: we can start to see that in order to describe any (arbitrary) actor, it is necessary to describe the network of interactions with other actors within which this actor is situated. The patent would not have had the same agential capacity (and would have perhaps acted as a different entity) without an overarching database, an applicant to search in the database, a search engine to search for the applicant that searches in the database, a login granting access to (that particular piece of) the internet, a web browser to navigate to the search engine, and all the interactions between these actors.

Descriptions and visualizations as the one above, focusing on the constitution of the network, provide one possible way to describe networks relationally: starting with a particular actor (e.g. 'patent'), it is possible to read the constitution of the network by means of analyzing

the interactions that this actor establishes with other actors. This focus on the coexistence of different actors and their interactions, however, closely resembles more traditional forms of social network analysis in which 'networks' are considered to be a blueprint and/or representing the a priori structure of social life (Knox et al., 2006). In our study, this is however only the first step, and moreover, the visualizations are not used to represent a kind of underlying network structure but rather as an attempt to give an adequate – both textual and visual – account of how academic practice is composed and how academic agency is possible when looking at clusterings of actors and interactions. As a consequence, it is necessary to pay direct attention, in a second step, to how academic agency is *distributed in* (and mediated by) larger wholes, and in a third step to how these larger wholes *associate with* each other. Specific attention will thus be devoted to descriptions that pay attention to the distributive and associative characteristics of the actor-network.

Distribution: Regions

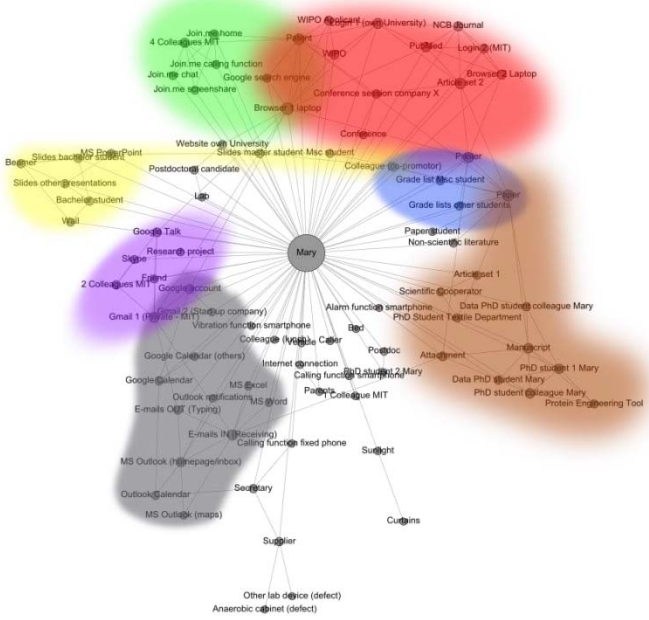


Figure 3.2. Actor-network of Mary's course of the day with particular regions highlighted. Since Mary is implied in almost each interaction, for the sake of visual clarity she was not included in the different highlighted regions.

Figure 3.2 is the same visualization as Figure 3.1, but with some specific regionalisations highlighted. These regions were constructed by highlighting clusters of actors that interact with each other, that is, these are the clusters of actors and interactions that emerge and become visible when looking at academic practice topologically (see earlier in this chapter: force-based method forming regionalizations). Seven different regions are foregrounded. In the descriptions that follow, we will point at different operations that are taking place in each region and by means of which different operational effects are performed. Take, for instance, the yellow region at the left. This group contains actors related to **preparing** a defense (see the interview transcript given above): we can see presentation software (MS PowerPoint), different slides of different students that were projected and integrated into the presentation of the defending student, a beamer, and two persons (a bachelor student and a colleague of Mary). The interactions depicted in this region consist of this bachelor student (in front of her promoters) rehearsing the defense that she had to present officially the next day and, afterwards, a revision of this PowerPoint presentation conducted by both the student and these two promoters (Mary and a colleague of hers). Different operations assisted in enacting this region into being: by rehearsing the defense, a future event was *projected* as happening in the present of that day. Furthermore, slides of different presentations were considered as being different *modules* that can be inserted in one overarching presentation. This implies that these different presentations were treated as being *analogue* with respect to their ability to contribute to the defense of a single student. Secondly, the brown region shows a clustering around manuscripts written by different PhD-students. What this region highlights, is the **processing of a text**: by discussing manuscripts, texts are processed in such a way that language takes up a further digital form. Again, the region displays no isolated actor and interactions but on the contrary involves many different actors and interactions in order to process text. A lot of actants and interactions need to be mobilized: the PhD-students themselves, scientific cooperators, data produced by different persons, software tools, other articles. Equally, a lot of operations are at work in order for this region to operate: language was *textualized*, points of view vis-à-vis a particular text *multiplied*, previous versions of these manuscripts were *redacted*. Third, and as far as the blue

region of the visualization is concerned, in this section we can see the same colleague of Mary together with some grade lists that were printed on paper. In this case, the region that is formed is equally composed of a form of **processing**, but this time of **students**: the blue region depicts a meeting in which Mary and her colleague deliberated whether or not different students were eligible to obtain a particular grade. This was rendered possible by the *delegation* of activities students performed during a whole academic year (and other human and non-human actants that co-constituted this activity) in a tiny list of grades. Indeed, by means of a couple of people and paper documents (grade lists), a judgment is formed that *grades* and thus processes all work students performed in the course of a year into a single *number*.

It is particularly interesting to see how these three regions, as clusterings of different actors and their mutual interactions, and the operations that take place in each of these regions, bring about different operational effects. That is to say: each region entails particular mechanisms that modify what each actor is, does, and can do. It would be impossible to describe all operational effects. Therefore, we will limit ourselves to the effect generated by the central operations in each region. In the preparing practice, for instance, the future (the defense) is being designed, but this designing at once implies that *present activities themselves* (in the form of rehearsing and the modification of PowerPoint slides) are being organized in order for the future to happen in this particular manner. In the case of text processing, different authors that contributed to the manuscript are coming into being, and this creation of authorship directly implies that these manuscripts are being mandated, that is, that a manuscript is being made to circulate and to speak *for itself*. In the region of student processing, students receive added value and by this very act of evaluation, Mary and her colleague are themselves at once rendered as being centers of authority (that are able to judge) and validity (that are making a right judgment) for students. In other words, academic practice is composed of regions, each with particular operations that perform certain effects. It is important to stress that these effects are not to be understood as one-way causations or input-output relations, but instead as mechanisms that modify several actors at the same time in the their process of execution: being engaged in designing a future *is at the same time* moderating present activities, the creation of authorship *is at the same*

time mandating manuscripts, and students receiving added value *is at the same time* the establishment of centers of authority/validity (see table 3.1).

A similar description can be made for the other clusterings of actors and interactions. The green one, for example, displays Mary and four colleagues working overseas at MIT, in what could be referred to as **convening**. The meeting that is displayed in this region took place by means of a piece of software called *Join.me*, which is a meeting tool by which one can not only video call each other, but also share each other's screen footage. The already discussed patent makes a new appearance here: retrieved by a search engine and a browser, it is shared amongst the participants of the meeting and the meeting tool. What is happening in that meeting? Things are being said to each other, thoughts are being typed into the chat window, opinions are uttered, strategies re-viewed. In other words, both humans (Mary, colleagues) and non-humans (a software program with a manifold of functions, a patent, a browser) are *allocated* over different parts of different screens, thus forming an assemblage in which both these humans and non-humans are *figurated* and *textualized* into a particular imbroglio. It is an imbroglio where language, interactions, emotions, concepts, strategies, inventions, and so on are dealt with in a *fluid virtual gathering,* but this gathering gives at once a *stable reality* to the invention (in the form of a patent) discussed; the virtual gathering around the invention constitutes a reality.
What about the red region in the upper right? This region displays activities that took place with respect to **retrieving** the aforementioned patent on the internet. Some familiar actants can be found here: the patent database and its applicant, a (first) login and a conference session. Since the daily browser was only able to log in at one account at a time, a second browser was used for navigating to journals not accessible by the login of Mary's prime affiliation. Mary's second affiliation to another university, however, enabled a second browser and a second login to obtain articles from the journal 'NCB' (Nature Chemical Biology) – articles that were searched first of all by the search engine *PubMed* and that were printed afterwards. This retrieving, then, is enacted by operations of *localization* (of the patent on the world wide web) and *privatization*: the information that is retrieved is not available for every interested reader to localize, but requires a bypass in the form of a login in order to be granted access. Another operation at work is an operation

of *exscription*, by which something is given 'out of hand' and in that sense being exscribed to another location. In order to retrieve a patent, for instance, the search terms are exscribed from the first localization and the concomitant first login request to *another* website (the journal website, denying entrance), from the second browser and the second login to *another* website containing *another* database, from this database to *another* applicant, and so on. In other words, public research results are requested, but this requesting at once entails a disclosing of either availability (in case of a correct browser-login combination) or unavailability (in case of an dysfunctional combination).

Another region pertaining to the distribution of the network is the bottom grey one. This region displays a **communicating** clustering – communication here referring to more than passing information, but referring to what is needed. More specifically, all actors that were permanently mobilized – in the sense that they were permanently at hand in a standby position – in the course of the day are displayed here: different e-mail accounts that were active all day long and that were maintained either by a browser or by an e-mail program, calendars of different people that furthermore synchronized through a Google account, notifications that popped up on the laptop or smartphone screen when a new message arrived. These actors, which are not only permanently mobilizing humans (for instance, mails being checked by Mary) but also each other by means of synchronization (e.g. Mary's calendar automatically synchronizes with calendars of other people when these people add or change a particular time slot), are in a certain sense realizing academic presence: Mary, but equally other people with a Google account or with a connected calendar, is being rendered present by displaying her calendar and a permanently mobilized e-mail account, for instance. This realizing of academic presence is at the same time creating and sustaining (potential) future interactions with others: knowing when someone is available (or not), or being available for incoming messages and notifications (or not), activates the possibility of interaction with this or that person.

The last region on the map, the purple one, is directed towards **arranging** particular things. Here, we retrieve again the e-mail and Google account, but equally another VoIP program (Skype) and a chat program, some colleagues, a friend and a research project. What is

visualized in this region is a conversation Mary had with these colleagues both on Skype and on a chat program, and a conversation she had with a friend on that same chat program. Again, we see how spoken language is textualized and how human actors are figurated onto a screen, but equally how an operation of consultation of different software programs enacts processes of arranging. This arranging brings about operational effects where making commitments to other colleagues and friends is at the same time deploying several social prostheses: not only a VoIP program, but equally an account, another chat program and an e-mail program.

In sum, textual and visual accounts in terms of clusters of actors and interactions show that, and how, academic practice is composed of several region. We have described how each of these clusterings entails some very specific operations that allow for each actor (Mary, but equally all other actors) to do what one did on that particular day. Furthermore, instead of explaining academic practice by its aims, functions or intentions, each regionalization allows to describe specific operational effects: academic practice in the making means for example for Mary that through her activities, she is engaged in establishing authority, sustaining potential interactions, designing the future, … The next paragraph analyzes how these different regions associate with each other, viz.: how does one clustering of actors and interactions relate to another one? Are there even clusters to be found that are related at all? Are there some actors in academic practice that glue different regions together?

Table 3.1. *Overview of different regions, operations and operational effects.*

	Operations	**Regions**	**Operational effects**
Yellow	Analogization Modularization Projection	Preparing	Designing a future ≈ Organizing present activities
Brown	Textualization Multiplication Redaction	Text processing	Creating authorship ≈ Mandating manuscripts
Blue	Numerification Delegation Gradation	Student processing	Adding value to students ≈ Establishing a center of authority/validity
Green	Allocation Figuration Textualisation	Convening	Conducting a fluid virtual gathering ≈ Giving a stable reality to something
Red	Exscription Localization Privatization	Retrieving	Requesting public research results ≈ Disclosing (un)availability
Grey	Mobilization Synchronization	Communicating	Realizing academic presence ≈ Creating and sustaining (potential) interactions
Purple	Textualization Figuration Consultation	Arranging	Making commitments ≈ Deploying social prostheses

Association: Boundary actors, infrastructure

Figure 3.2 additionally demonstrates that several actors are situated at the intersection of two or more different regions: a printer, paper, the patent, a browser, a search engine, a mail function, a Google account and a colleague of Mary. That these actors are situated at such intersections, or, in other words, that they are residing at the border of two different regions, implies that these *boundary actors*[12] make it possible for multiple regions to be enacted in that particular matter. Without paper and a printer for instance, Mary would never have been able to judge a student's work with a colleague (with printed grade lists lying in between them) or discuss manuscripts with PhD students in this particular way. Equally, without these two boundary actors, the patent or the article set would remain somewhere in the browser, inhibiting the possibility to show only the online meeting on the laptop screen (instead, Mary would have had to switch between different windows: that of the browser, and that of the join.me software). Or to state this in other words, each of these boundary actors is employed in both these practices and thus enables for switching between two adjacent regions. For instance, both the printer and the paper possess the capability of mediating different aspects of academic work and switching rather easily between them (having a meeting, discussing manuscripts, judging). The same applies for the other boundary actors: the browser enabling the permanent mobilization of various other actors (e.g. different e-mail accounts and calendars) and the retrieval of particular information such as a patent; the patent itself being at once both a subject of discussion or an object of retrieval; Mary's colleague enabling the effectuation of a trial presentation and acts of mutual judgment; etc. Boundary actors, by means of their capability to switch between and to mediate different interactions, are a first component of the association of academic practice, that is, they are important elements in the composition of different regions. A patent can be articulated both as subject of discussion or as object of retrieval; a browser can be articulated as being an enabler of mobilizations or as a retriever of information, etc. It is important to stress here that, precisely because these boundary actors are

[12] A notion that we adopted from Bowker and Star's (1999) *boundary objects*.

employed differently, they function as rather undetermined agents: the different usages in different regions places them (in contrast to more embedded actors) on their own. Boundary actors such as a Google account, a patent, a printer, are consequentially somehow highly visual and perhaps appear almost as mere 'objects' to be used, but not because they are disconnected and stand on their own. Rather, they are boundary and, as such, have more 'authority' exactly because they interact with actors of different regions.

A second component related to the association of academic practice, pertains to the infrastructure of the network, holding different actors and clusterings into place.

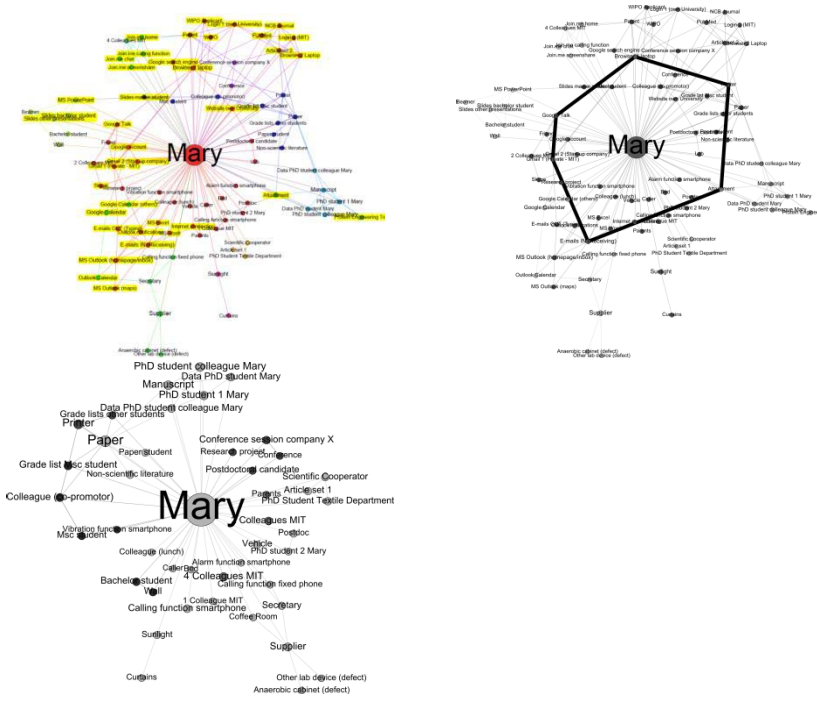


Figure 3.3. Actor-network with all digital actors highlighted (upper left), particular digital actors forming the network's abutment highlighted (upper right), and all digital actors omitted (bottom).

In Figure 3.3a, every digital actor is highlighted on the left side: pieces of software (e.g. Join.me, the Protein Engineering Tool), computer

programs (e.g. Word, Excel), apps (e.g. calendar), communications (e.g. incoming and outgoing e-mails), websites (e.g. search engines, WIPO), etc. It takes little effort to see that these actors are quintessential in relation to the rest of the map: when we remove these actors, the network breaks apart in a bunch of 'isles' (a tiny and isolated bunch of connected actors) and 'satellites' (one isolated actor connecting solely to Mary) as can be seen in Figure 3.3c on the right where actors of (obvious) digital nature were omitted. Most remaining actors only have one connection left (with Mary) or assemble into a tiny and isolated isle centered around the actor paper. Without e-mail programs, web browsers, internet connection, communication programs and office software, the academic assemblage on that particular day would indeed stop to be an associated assemblage but rather a disparate whole.

How to account for this? Digital actors are spread all over the map. In that sense, these actors form a cloud or a swarm that is spread all over the network and are in that sense *inciting* the network. This means that they allowed for the performing of all the activities and operations that day rather than being for instance one singular point (and region) in the network that one should pass. In contradistinction with the notion of 'boundary actors', this digital swarm is not related to two particular regions of the network but rather connecting throughout. It could thus be stated that this swarm constitutes the 'infrastructure' of the (networked) academic practice, consisting of both more connected actors that are omnipresent (e.g. browser) and more marginal actors whose presence is not large but equally pervasive with regards to the academic practice that is eventually formed (e.g. calendar). The different regions in the academic practice in other words share a similar infrastructure. In a similar vein, if one looks at Figure 3.3b, we can see a highlighted polygon tying together six digital actors. Drawing again on topological language, it could be stated that this hexagon acts as a digital interface allowing for fast transportation between different regions of the network: this polygon of computer-related actors ties together most other regions on the map in such a way that it is rendered possible to switch fairly rapidly between different regions. Since the polygon is consisting of computer-related actors, Mary did not need to move or dislocate herself in order to switch between different regions. In this academic practice, there are thus not only boundary objects discernible,

but equally a digital 'interface' connecting several regions and hence enabling a relatively fast switching from one practice to the other without having to move oneself. The digital actors of the assemblage, clearly, make certain things possible such as communicating overseas by means of the Join.me program, finding a patent in a database, or e-mailing for instance. More important, however, is that these actors make it possible to switch between, for instance, student processing and text processing and, due to the infrastructure that acts as an interface, to switch quickly from one academic region to the other without actually moving.

Discussion and conclusion

In this contribution, we tried to trace the composition of academic work with a particular focus on the role of both human and non-human elements herein (Latour, 2005a; Landri & Neumann, 2014). Indeed, approaching the composition of academic work as consisting of actors and interactions that are always (in the process of being) in the making, allows to see the vast amount of such actors and interactions that are mobilized in order for academic practice to be taking place at all (constitutions), to see the clustering in academic regions (distribution) and to look at how regions of academic practice relate and assemble (association). In this conclusive section, the findings of this study will be highlighted and we will try to show what can be gained by investigating the composition of academic work from a sociomaterial approach.

As was stated in the introduction of this chapter, many research dealing with the current condition of the university today is focusing on major societal evolutions, such as digitization, and how these evolutions impact or influence what it is to be an academic or a university today. These ways of conceptualizing tend to presuppose that there already *is* something called "a university" as being a contrivance of some sort and delineated academic work performed in this institution (cf. Calhoun, 2006; Oakeshott, 2004). This study, on the other hand, analyzed academic work from the viewpoint of the daily activities performed by an academic and without specific presumptions about the nature or purpose of these activities. That is to say: we did not consider

digitization as being an input factor that directly influenced academic work (as output) but rather investigated the concrete interactions and operations involved in the composition of academic work. Hence, our starting point was that academic activities are *enacted* in practice rather than already predetermined beforehand (Latour, 1987; Mol, 2002; Law, 2009b). This was in a first movement made manifest by analyzing the constitution of the network, by which we tried to demonstrate a first consequence of adopting a relational point of view, that is, that different actors can do what they do because of their interactions.
The analysis of the distribution of academic work in terms of its regions pushed this relational point of view further, by demonstrating that there are equally clusters of actors and interactions into larger wholes that take up the form of a designated *region*; the actors in these clusters interact more among themselves then with other actors. This, first of all, made clear that a very variegated amount of different regions are being established in the course of one day. If Mary would only have read a scientific book during that particular day, for instance, the network would only have consisted of a very tiny amount of actors and interactions (and hence, there would be only one region which would coincide with the overall network itself). Secondly, the analysis of the distribution tried to conceptualize what happens in these regions of academic practice, and moreover how each of these regions has operational effects, that is, mechanisms that are put into action when operations are performed. The region of convening, for instance, transforms an invention/patent into a stable reality but at once also render this reality very fluid; text processing creates authorship which is at the same time a process where scientific manuscripts received a kind of mandate; mobilizing and synchronizing operations in a communicating practices realize academic presence, which is at the same time creating and sustaining a condition of potential interactions, etc.

In a third step, this study showed that different boundary actors associate different regions and in this way stabilize academic work; they enable to switch quickly and efficiently from one region to another adjacent one, and hence from activities related to convening to retrieving, from communicating to planning, etc. As such, boundary actors do not possess one unequivocal function but, on the contrary,

install a certain efficiency and flexibility that allows to conduct a manifold of different activities in the course of one single day. Moreover, their interconnectedness gives them also a certain authority, at least in comparison to other actors that are completed embedded within one region. It is in this respect that it might be hypothesized that such boundary actors – a browser, a printer, a colleague, Google – precisely because they enact different academic activities simultaneously, are prototypical 'academic actors'. At least, they seem to express things that several different regions in academic practice share. This process of associating was furthermore highlighted by pointing to the infrastructure of the network: digital actors were immanently present in academic work. This on itself is of course nothing new. However, by showing that the infrastructure of the network is of a digital nature and in a sense even forming the interface of the network, it seems not to make much sense anymore to talk about academic practice in terms of humans or non-humans, material or digital, etc., It perhaps makes more sense to speak of each actor in the network as being *humandigital*. Considered likewise, it seems no longer fruitful to speak about 'the digitization of the academic profession' as if digitization constitutes some kind of input factor that directly alters academic work (as output). Rather, further research along these lines could focus on questions such as: how are humandigital interfaces looking like precisely? How does the fact that an academic herself does not need to move in order to switch between different regions impact the composition of academic work? Are there difference in the humandigital when comparing different academic practices? From such an angle, it may also be possible to rethink the often perceived tensions between how academic work is being experienced on the one hand and more classical a priori conceptualizations of the nature of academic work on the other. Although classical distinctions between research, teaching, and service 'functions' or ' activity domains' are often used, it is unclear whether they are actually useful as account of what takes place in academic practice. Perhaps when all of these so-called different activities rely on similar academic boundary actors, humandigital interfaces, and the like, other accounts have to be given, and perhaps perceived tensions in academic practice can be made visual and textual.

In sum, sociomaterial approaches, focusing primarily on interactions, might constitute a fruitful addition to more traditional research about the university that is inclined to focus on epochal changes that are suggested or expected to alter the position of academics and the university (e.g. Fanghanel, 2012; Nelson & Wei, 2012; Weller, 2011). Whereas these more traditional approaches tend to conceive of the university and its inhabiting academics as consisting of firm structures and of fulfilling clearly delineated tasks, analyses like the one above might be beneficial in adopting an empirical gaze that focuses on practices and how these practices (and actors and relations as components of these practices) mediate the composition of academic work. Furthermore, this study can be considered as being complementary with studies that try to grasp the uniqueness of the university, either in terms of the specific functions that this organization performs or in terms of it instituting a unique idea (e.g. Barnett, 2011; Readings, 1996; Oakeshott, 2004). If we do not consider the university as a contrivance with a specific sets of functions or incorporating a specific idea, but rather approach the university in terms of practices that consist of various kinds of humandigital activities, the questions that are in need of further elaboration are: Which *forms* are typical of academic or university practices as they are enacted today? And: are there *modes of being and interaction* that are typical of different academic practices? (see also, Masschelein & Simons, 2010). This is not only a sociological question on educational issues, but also an educational question in and on itself, and hence a first step in the development of an *educational* understanding and theory of academic practice drawing on relational and sociomaterial analyses.

CHAPTER FOUR: AN ATLAS OF ACADEMIC PRACTICE IN DIGITAL TIMES[13]

Introduction

In current literature on the university it is generally accepted that processes of digitization have had, and continue to have, a profound influence on both the daily functioning of the university as an institution and on the academics that inhabit and give shape to it. Over the last two decades, for instance, it has often been argued that some kind of "digital" university is coming to the fore, a university that looks profoundly different from the university-as-we-knew-it. This traditional university is then conceived as an institution, hardly changed since its inception in the Middle Ages, where a congregation of professors and students gathered physically in order to pursue some kind of Truth (in the broadest sense of the word) (Illich, 1991; Newman, 1999; Masschelein & Simons, 2011). Characteristics of the 'new', digital university on the contrary would include a different external and internal organization comprising, among other things, an open character, a flexible networked and non-hierarchical culture, an increasing globalization of research and knowledge, etc. (De Wit, 2007; McCluskey & Winter, 2012). All in all, a lot of hyperbole surrounds current discussions about the role or impact of 'the digital' on universities worldwide (Woolgar, 2002; Ruppert, Savage & Law, 2013).

Contemporary empirical research on the current condition of the university can be roughly divided in to two main categories. On the one hand, much research adopts a *personal approach*, frequently directed at the *self-understanding* of academics, that is, at how academics themselves perceive certain aspects of their jobs. This personal approach has made

[13] This chapter is published in: *Open Review of Educational Research, 1*(1), 116-143.

clear that the professional life of these academics is increasingly rooted in digital technologies, and that this is changing the very nature of the work they are doing. As such, the personal approach results in studies providing detailed analyses of the sense-making of academics with respect to 'digital' aspects of their profession and how these academics deal with such aspects of their daily professional life (e.g. Kuntz, 2012; Ylijoki, 2013; Tuchman, 2009). A second approach, on the other hand, could be termed as *contextual*. This approach focuses on how broad technological and societal evolutions *impact* the university in particular today, and as such tries to grasp how digitization, as a contextual-societal input factor, influences the very nature of what it is to be an academic or a university today, as some sort of resulting output (McCluskey & Winter, 2012; Peters & Bulut, 2011). In this regard, this second research strand closely resembles other contextual studies that seek to clarify how particular societal processes (e.g. globalization, marketization) impact on the university today (Nelson & Wei, 2012; Readings, 1996).

This chapter adopts a third, sociomaterial approach to this matter. Whereas the aforementioned approaches tend to focus either on the person of the academic herself or on the university as an institution, in this chapter we are focusing on academic *practices,* constituted by both human and non-human actors, and how the digital acts and operates in these practices. That is to say: this third approach focuses on the *composition* of academic work in general (e.g. Hamon & Rotman, 1981; Latour, 1987; Latour & Woolgar, 1986) and on the agency of the digital in this composition in particular. By doing so, this chapter will investigate academic practices in the making by disentangling the (relations between) human and non-human *actors* constitutive of the formation of a particular practice (Fenwick & Edwards, 2010; Latour, 2005a; 2010b). The central *empirical* focus of the chapter is directed toward the role of the digital in this composition: how does the digital play a part in shaping daily academic practice? In order to answer this general research question, this chapter argues that specific and innovative methodological and analytical tools are needed in order to scrutinize this composition. Using visualizations not as mere illustrations but as integral to the investigation, is an analytical technique whose importance has only recently been recognized, and which has been used very scarcely in sociomaterial studies until now (Latour et al., 2012; Marres, 2012a). We

will first describe this methodological vantage point, which is based on *topological visualizations* of networks of academic practice. After that, we present the visual and written results in the form of a (topological) *atlas* in order to end with a coda in which we elaborate on our findings and connect them to some points outlined in this introduction.

Modes of inquiry

Data collection

In order to analyze the composition of academic practices, a methodological design was devised that would enable us to meticulously follow the different actors populating these practices. To that end, we interviewed six purposefully sampled professors (different countries, universities, fields of research) about their previous working day, that is, from the moment of waking up till the moment of going to sleep – as we did not want to make presumptions about what constituted work time and an 'academic activity' and what not. Specifically, in order to focus on these actors and interactions, and slightly inspired by the interview to the double (where respondents are asked what a double of them would have to do in order to function normally during the course of a working day – Nicolini, 2009), each interview was set up as a kind of *hearing*, where we asked each respondent to report on every detail of what s/he did the previous day. The role of the interviewer was to pose questions that would retrieve as many details as possible about the actors (colleagues, students, paper, pc, …), and the interactions between these actors (using, typing, talking, …). In that respect, the contents, feelings or meaning-giving of the respondent were of no primary concern. Rather, the interviews were designed so as to make each respondent an observer of her own activities during the previous day. Hence, the focus was on what might be called the *direct sphere of interaction*, that is, with which human and non-human actors a respondent interacted. After transcribing each interview (duration: 1,5-2h) verbatim, the transcripts were considered as *observer notes* that presented six accounts of academic practice, focused on the actors and interactions that assembled on these six days (see chapter 3 for a detailed elaboration).

Data visualization

The visualization process started with the study of each interview transcript to identify different actors of all kinds. Since sociomaterial analyses try to keep the level of analysis as flat as possible (Latour, 2005a), we refrained from introducing 'aggregated' actors – especially in the case of computerized actors. That is to say, if a respondent mentioned that she used a computer for a particular activity, we did not use 'computer' to be at the level of an actor, but rather the specific *software program* (e.g. word processor) or *software function* (e.g. the search function of a particular program) that was used at that particular moment. Simultaneously, we listed all interactions, that is, actions that took place between – inter – different actors, e.g. between an academic using a software program, between two synchronizing software programs, between two people discussing a certain matter, etc. Second, we visualized the resulting constellations of actors and interactions through the graph visualization program *Gephi* (www.gephi.org; Bastian, Heymann & Jacomy, 2009). Each graph consists of nodes ('dots') that visualize actors and edges ('lines') that visualize interactions between actors.

The overall form of each network was then obtained by deploying a *force-based* algorithm called ForceAtlas (Jacomy, 2011). Force-based algorithms model the overall shape of a graph in such a way that they render the connectivity of actors visually intelligible: linked nodes attract each other, whereas non-linked nodes are given a repulsive force. Consequently, the relative position of a node vis-à-vis another node is dependent on the connections of this node with other nodes (Severo & Venturini, 2015: 8; cf. chapter 3):

> Once the algorithm is launched it changes the disposition of nodes until reaching the equilibrium that guarantees the best balance of forces. Such equilibrium guarantees that if two nodes are close […], they are connected directly or indirectly (connected to the same set of nodes). In other words, the fact that a node is positioned at the top, bottom, right or left margin of the images is fortuitous, but the fact that it is positioned toward the margin (and not toward the centre) and the fact that it is positioned close to some nodes (and not others) is meaningful. Running the same spatialization algorithm several times,

> the images could be rotated or flipped, but the relative position of the nodes would not change (close nodes will always be close, far nodes will always be far).

The ForceAtlas algorithm thus spatializes a network of nodes and edges based on an attraction of connected nodes and a repulsion of non-connected nodes, eventually leading to different *regions* in a graph. At the moment of writing this chapter, for instance, not only are there two authors involved, but equally a screen, a word processor, a printer, and so on, all of them interacting with each other: the authors reading the screen, the word processor inciting the printer, the printer instructed by the authors, etc. Because all of these actors interact with each other, the force-based algorithm would visualize this distribution in a region of interconnected nodes positioned close to each other. In what follows, attention will be given to academic practices in terms of regions of actors and interactions. These visualized regions are, then, neither derived from the intentions or sense-making of academics, nor from the content and meaning of their interactions, but rather from the intensity of these interactions. In other words, instead of looking at academic practice as an a priori set of 'domains of actions' (e.g. teaching, service, research), Gephi visualizations allow us to scrutinize the composition of academic practices by distinguishing regions of actors, based on the intensity of their interactions.

Third, once all the nodes and edges had been entered into the database, we focused on different aspects of each visualization. This was done by manipulating different parameters: different sizes of nodes (more interactions leading to a bigger node); different colors of nodes according to the type of actor (digital or analog for instance, see table 1); different emerging regions (stressed by highlighting/encircling them – see Latour et al., 2012). The last option was effectuated by means of the vector graphics program *Inkscape* (www.inkscape.org).

Overall, this process of data visualization resulted in six different maps of academic practice (one per respondent), each map having its own distinct characteristics. We analyzed these six maps separately and collectively according to five topological dimensions.

Table 4.1. *Five topological dimensions of the visual analysis.*

	What	**How to read**	**Dimensions**
Regions	(Visual) areas in the distribution of academic practice, consisting of a concentration of actors and inter-actions.	Regions consist of actors that interacted more with each other than with others on that particular day. As such, they allow for a spatial understanding of activities that took place (but not necessarily chronologically).	*Demarcated:* Maps are demarcated when they consist of regions that barely overlap. *Concatenating:* Maps are concatenating when they consist of many overlapping regions.
Centers	Relatively highly connecting actors within a particular region.	Centers are always located within a particular region, since they connect with/to many other actors. As such, centers are always centering.	*Centers:* Actors with many connections, positioned in star-like formation. *Periphers:* Non-centers.
Density	Interconnectedness of actors in a region.	The density of a (part of) a map tells something about how 'busy' a particular aspect of academic practice is. A high density implies that many actors are mobilized in order to (per-)form a particular activity.	*Low density:* A region or map has a low density when there are not many connections between actors. *High density:* A region or map is dense when there are a lot of connections between actors.
Interfaces	Parts of academic practice where the boundary between two or more regions is permeable.	The permeability of a region points to parts in a network where one or several actors are being deployed in more than one activity in order to conduct particular activities.	*Boundary actors:* Actors positioned at the border of two or more regions. *Boundary zones:* A group of actors positioned at the border of two or more regions.
Infrastructure	These partitions of kinds of actors that populate a particular map.	The infrastructure of a map contains several types of actors (but in varying degrees) and as such tells something about the kinds of actors that connect the overall map throughout.	*Digital:* All digital actors, colored red. Examples: tree structure of e-mail program, web browser, chat program. *Analog:* Nonhuman actors that are not digital, colored yellow. Examples: paper, pen, coffee. *Digital-analog:* Nonhumans that are both digital and analog, colored orange. Examples: printer, computer screen. *Human:* Human actors, colored green. Examples: colleagues, students. *Generic:* Neither digital, nor analog actors that are of a more generic kind, colored grey. E.g.: research project, art history.

Data analysis

In the (sociomaterial) interest of analyzing academic practices from the starting point of the actors and interactions in these practices, this composition is presented in the form of *topological* visualizations. It is important to stress that topological visualizations of academic practice need to be interpreted in a specific way, that is, they require a specific way of reading and looking. Instead of looking at what happens when, and for what reason (focusing on chronology, intentions and explanations), the focus is on who and what plays a role, and the relations involved in this who and what (focusing on topology, distribution and rich descriptions). In order to focus on this who, what and how, the composition of academic practice will be visually analyzed along five dimensions, characterizing the particular *form* of an academic practice as spatialized by the ForceAtlas algorithm: regions, centers, density, interfaces and infrastructure. These dimensions draw on sociomaterial literature giving topological accounts of the concrete composition of different practices (Latour et al., 2012; Law, 2002a; Mezzadra & Neilson, 2012; Martin & Secor, 2014; Bowker & Star, 1999; Venturini, 2013 – see also chapter 3).

Based on the visual analysis of each map along these dimensions, we were able to discern three different profiles of academic practice. Each profile consists of a number of *homeomorphic* maps: that is, even though the different maps of academic practice in one profile are (obviously) not the same, they nevertheless take up a similar *form* when analyzed along these five dimensions (Law, 2002a). Furthermore, the *implications* of the three profiles of academic practice (including their respective homeomorphic compositions) will be analyzed. That is to say: compositions are never neutral, but on the contrary always enact particular relational effects. Of course, several effects could be studied, but we will limit ourselves here to those effects that are often mentioned in (topological) literature, namely effects on the actors in these compositions and the inauguration of highly specific spatiotemporal constellations (Barnett, 2011; Law, 2002a; Thompson & Cook, 2014). Therefore, in addition to each profile an account will be given of the

particular implications of each profile on the sort of actors, space and time enacted. Furthermore, and where illustrative, quotations of the interviews were used as complements to the analysis. All this (the collection of topological visualizations in the form of maps, rich descriptions and implications) constitutes an *atlas* (of the composition) of academic practice.

Furthermore, in the process of data analysis, we adhered to the interview transcripts/observer notes without making any additional explanatory or contextual additions to them. That is to say, we took these notes to be a unique *infralanguage* of the respondents (Latour, 2005a). Additionally, in the accounts composed we will use what could be called quasi-concepts: *concepts* because they try to offer an account of what happens in a particular situation, *quasi*-concepts because these concepts do not jump towards the level of providing explanatory generalizations and do not radically impose some kind of metalanguage on the language used within the described practices themselves. Precisely because they seek to give an account of topological distributions, such quasi-conceptual terms are often diverse and tuned to the composition at hand (chapter 3).

An atlas of academic practice

All figures in this atlas display visualizations of academic practice according to the design principles outlined above: each figure illustrates a (part of a) topological map of academic practice during the course of one day. The overall distribution of each map is highly different: we can see heavily populated and smaller ones; maps with low and high density; maps with many regions and maps with fewer regions, etc. In what follows, we give a rendering of three distinct profiles of academic practice. Each profile, we argue, has its own characteristics qua regions, centers, density, interfaces and infrastructure.

Profile I

Form

First, as can be seen in Figures 4.1 and 4.2, each of the two maps of this first profile displays well-demarcated **regions** that are positioned relatively separately. In Julian's case, an example would be the red one in which we can see a doctoral candidate, a PhD dissertation, members of a doctoral jury, etc. In this region, the actors present and the connections they established led to an activity in which a promovenda and her dissertation were being judged with respect to whether this dissertation was a valuable piece of academic work. That this red region itself is clearly demarcated implies that this activity of judging did not mobilize actors from other regions (except for the actor 'paper' – but see below), or to rephrase this point: it implies that this activity of judging was effectuated by means of regionally-specific actors, that is, actors deployed in only one specific region. This equally applies for Eugene's map, of which one region is displayed in Figure 4.3. This yellow region shows a conglomerate of actors that point to activities of retrieving information (by means of two different browsers and two different websites) and of storing that information (by means of a note-taking and archiving piece of software). Demarcated academic practices, then, point to conglomerates of regions in which very specific actors with a clear-cut 'function' are deployed in order for activities to be able to occur: the browser retrieves information (and does not do anything other than this in the course of a whole working day), the note-taking app stores information (and does not do anything other than this in the course of that working day).

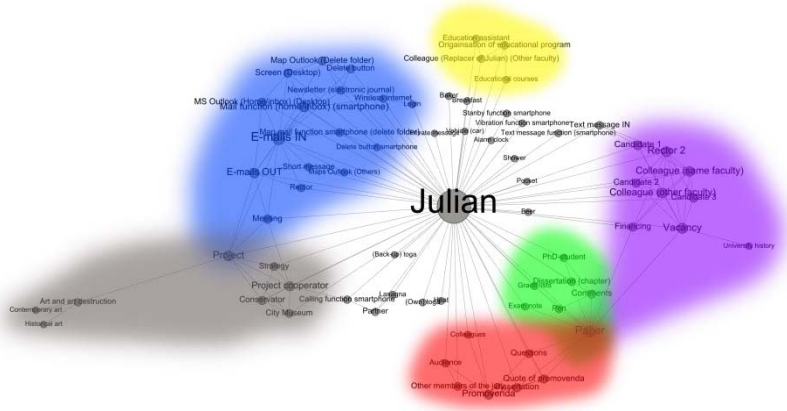


Figure 4.1

Second, the **density** (visual interconnectedness) of most regions in this profile is relatively low. This is illustrated in the two regions just mentioned and in Figure 4.4, which displays activities related to the preparation of several meetings. Actors in these regions are (relatively) placed on their own. Being placed on their own, it can be argued that these actors do not mobilize many other actors but are rather self-contained. A file hosting service, for instance, enables different documents to travel from one place to another (that is, affording mobility), without affecting them (that is, remaining immutable), and hence gives shape to academic practice without having to mobilize many other actors. This differs in the two blue clusters that visualize communication (e-mail) activities: both the number of actors and the regional connections between them are manifestly higher. Indeed, these regions are the only two in this profile in which the density is relatively high. It is then not surprising that, third, two highly influential **centers** appear in these blue clusters: the e-mail in- and outbox. Another center is found in Julian's map (paper). Being a center is not only a matter of connectivity: many actors connect with, for example, the inbox, and so by being an important passage point for many actors (maps, e-mails, organizations, persons), the inbox obtains a powerful status, a status by means of which it gains *authority*. If an actor obtains/is granted the role of a center, then, this signifies that many other actors depend on this actor and hence that it is *being rendered* authoritative, precisely because other actors make it important (Figure 2).

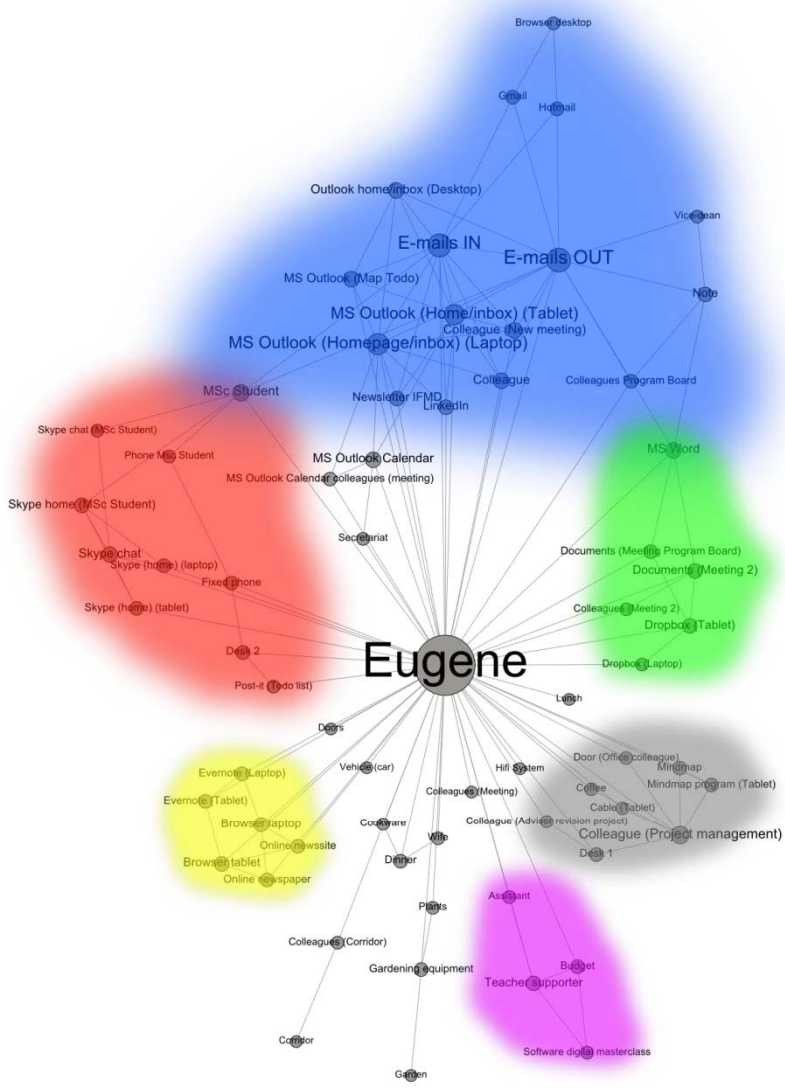


Figure 4.2

Fourth, since the two maps in this profile are characterized by a demarcated distribution, the permeability between different regions is rather low and hence there are few **interfaces** apparent in each academic practice. There are, however, a few actors that do constitute an interface

in between regions and hence enable a switching between activities. The actor 'paper' was just mentioned as an example of such a *boundary actor*, connecting three different regions and hence standing relatively on its own. By deploying an active role in three regions, the actor 'paper' allowed for each of the activities pertaining to these regions to be enacted in that particular manner, and hence also enabled Julian to switch between these three adjacent regions of academic activity. The other boundary actors present in this profile are a word processor that could be conceptualized as a form of 'digital paper' (Eugene), a research project (Julian), and a student (Eugene).

Figure 4.3

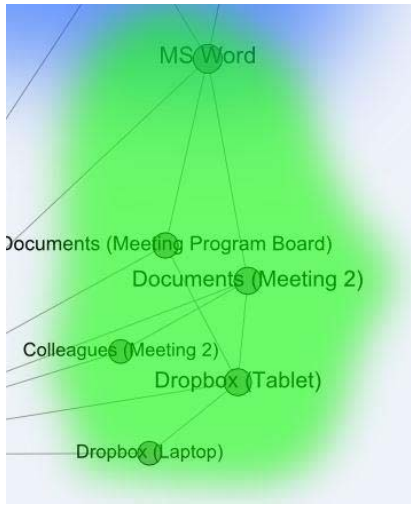
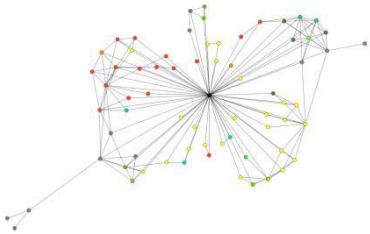


Figure 4.4

Fifth, as to the type of actors present, it is apparent that the **infrastructure** of the map largely coincides with the regions that have been outlined: Figures 4.5a and 4.5b show different types of actors spread over the map in a regionally-concentrated way. Despite the observation that Eugene's practice largely consists of digital actors (red), while Julian's map contains more human and analog actors (green - yellow), in both maps different regions coincide with different types of actors. For instance, whereas communicating is effectuated primarily digitally, judging and evaluating primarily take place by means of analog and/or human actors.



Fiugure 4.5 (a)

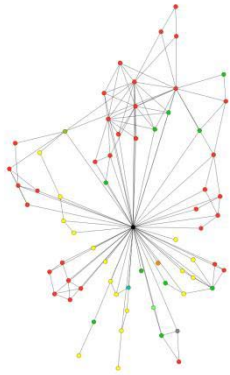


Figure 4.5 (b)

'Implications'

What do these homeomorphic renderings tell us? Just as in a traditional atlas, in which the form and ecology of a particular area of land, ocean, etc. tell us something about the implications of this for the population, the prevalent wildlife, the vegetation, and so on, the particular topology of each profile has implications for academic practice, namely what sort of *time* and *space* are created, and what sort of *actors* populate each profile. In a demarcated academic practice, many activities happen relatively separately/successively. Eugene, for instance, remarked with respect to successive activities that:

> You have to able to keep concentrating on the core task you are busy with. Otherwise, you get what so many people complain about: that they don't arrive at doing anything because of e-mail. (…) I deal

> selectively with e-mail. If there is an e-mail of which I think: 'This is important', but that doesn't need to be answered right away (…), I put it in another folder called 'to do'. And I deal with these each day at least half an hour, often outside regular hours, at evening after dinner.

As Julian remarked, this succession of one more or less self-contained activity after the other gave rise to what he called a *shredded whole*:

> It has something… It has something, yes, obnoxious, having the idea: 'I didn't do so much today', whilst you have been running around like a fool from 5am to 11pm, thus, I mean, these are long days… And that is the type of day that occurs even in less busy periods. It really is some sort of shredded whole.

In other words, this profile is characterized by a *managing of the present* in such a way that academic practice is "shredded" (what we have called demarcated) and made manageable by doing one thing after the other, such as for instance (only) the envisioned "core task" (and not combining that with processing incoming e-mails). At the same time, this managing of the present gives rise to what can be called *prefiguration*: by designing the day as some sort of to do list, future events are rendered present in such a way that one knows almost exactly what to do, at what time. Thus emerges a timescape in which academic practice is characterizable as a fragmentation of one activity after the other.

The demarcated academic practices of this first profile not only enact a fragmenting timescape, they also enact a sort of *mosaic* space, differentiated into functional spatial settings: having a meeting in one's office is done at one particular desk, whereas browsing the web or using other digital actors is effectuated at another desk (Eugene); having discussions with project collaborators or colleagues is always done in their office and not in one's own (Julian); work is principally all done at the university and never at home (Julian), etc. Consequently, and perhaps because of the observation that some activities are to be performed without digital actors of some kind, this mosaic space requires mobility on the part of the academic, who has to displace himself constantly from one setting to the other. This can also be derived indirectly from the visualized distribution of actors in the two different practices that belong to this profile: since most actors are regionally-specific, they pertain to one unique academic activity and are not deployed for different uses. Exceptions in this respect are the boundary actors mentioned, which

have an enormous importance: they are (undetermined and associating) *relays* through which some flexibility emerges and that have no region-specific place of their own (e.g. paper, a research project, a word processor). Even though these boundary actors are not the most prevalent, they have a decisive role in the conduct of academic practice and are perhaps, as we will argue later on, typically *academic* actors.

Profile II

Form

At first glance (Figure 4.6) the form of the second profile is similar to that of the first: most **regions** do not show many overlapping (boundary) actors but, rather, visualize demarcated academic activities. In total, six regions appear on this map. The two brown regions designate activities that took place in the private sphere. In the smaller brown cluster, the activity of waking up is displayed. In the bigger cluster, typical family activities are displayed: talking with other members of the family, watching TV, helping with homework, etc. In the grey region, a common activity, also found in the profiles of Eugene and Julian, is displayed, an activity of *preparing* something (in this case, educational courses). In the green region, a communicating activity is displayed in which Sandra communicated with, among others, her ex-promotors, by means of different smartphone functions. Additionally, Figure 7a (blue) displays the recurring communicating region, which takes shape around the two centers of incoming and outgoing e-mail traffic. Like the academic in the middle (i.e. Sandra), these two **centers** gather many heterogeneous actors around them: colleagues, students, hardware (keyboard and mouse buttons), different folders, sheets of paper, identifying numbers, etc. Figure 4.7a visualizes the distribution of these actors. All of these, even a seemingly banal actor like 'e-mail headings', for instance, take up an active role:

> Oh yes, I answered some e-mails. (…) But there equally are many mails of these newsgroups I have a subscription to. And I don't think that is nonsense, but you have to do that only if you have time. (…) Most of the time, however, it is click, shift, click, delete. So I select the whole gamut, and then it goes away. (…)
> **Yes. And do you open these [newsgroup] mails? (…)**

No, I am not going to get started with that. (…) Just, "Whoosh, away". No, I just delete those.

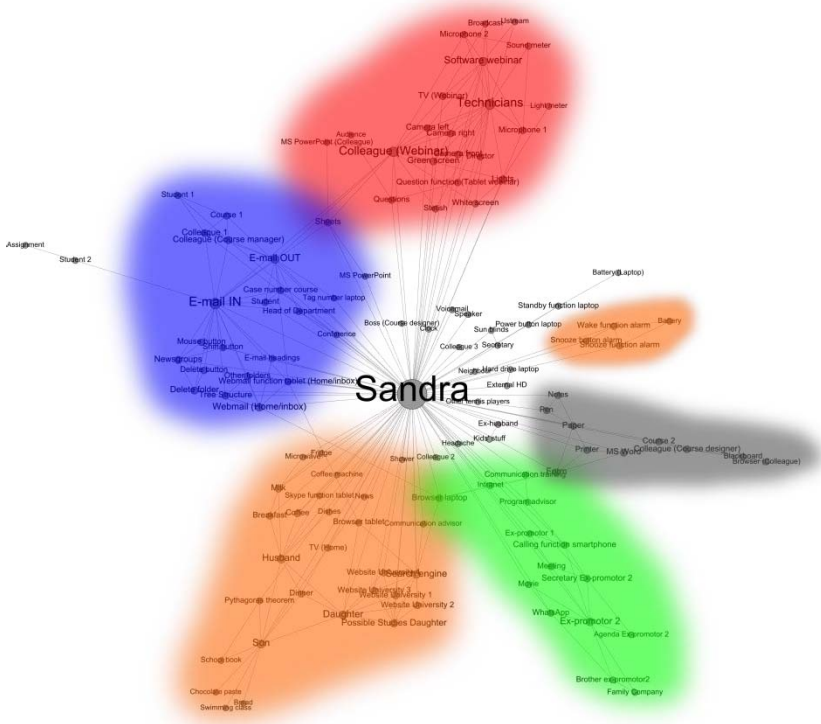


Figure 4.6

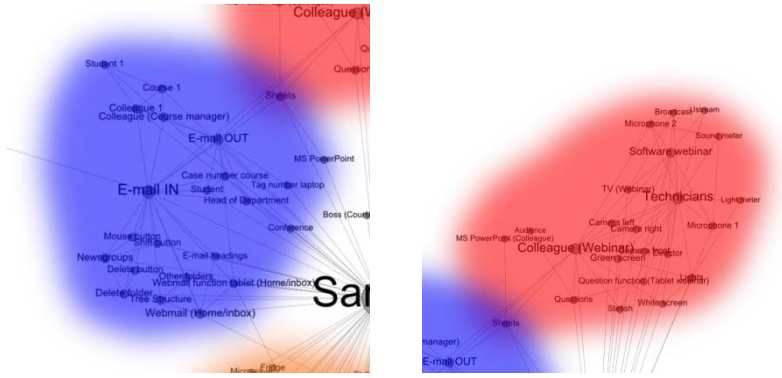


Figure 4.7 (a) *(b)*

Another region in this map is the red one, displaying a 'webinaring' activity. This webinar, streamed live to students, consisted of a session in which Sandra interviewed one of her colleagues. Figure 4.7b shows that this region is centered around some technicians, a colleague of Sandra and a software package. Other actors include a variety of technical (recording) equipment, but equally the aforementioned sheets of paper, an audience, etc. Together, they all made it possible that this webinar was conducted and streamed instantaneously to the computers of students who were watching Sandra and her colleague. In this region, we are thus dealing not only with centering nonhumans, such as incoming and outgoing e-mails as in the communicating region, but also with personae taking up the form of a center, who gain authority by means of their connections with many different other actors. Because both people (Sandra, technicians) and things (recording equipment, sheets) made some connection with this colleague, for instance, this colleague was granted an authoritative position: this variety of actors making a connection with that colleague meant that she was an authoritative actor in the distribution of academic practice that day.

Correlated to the higher prevalence of centers, the **density** of this second profile is manifestly higher: since actors are granting a couple of other actors an authoritative position, a process of mobilization takes place in which the interactions between different actors are crucial. As we have just described, many actors mobilize particular other actors (e.g. an e-mail inbox, a colleague) into the position of a center. This does not imply, however, that the relative importance of singular actors shrinks. On the contrary, it is only by means of the various connections of these singular actors that academic practice could be conducted in this manner: as the interview excerpt above shows, for instance, it is precisely these singular actors that are crucial in this process of mobilization as they enable some actors to emerge, eventually, as a center. In other words, a relational view situates authority not in the mere presence of an authoritative actor, but rather in the density of the relations between singular actors.

Furthermore, as to the **interfaces** of this second profile, three boundary actors populate this map: sheets (that were circulating in a communicating region and whose content was a matter of discussion in the webinar region), the browser of a laptop (deployed in both the green

communicating region and in a brown private region) and a form (connecting a communicating region and a preparing region). Again, we can see that these actors have an important role in the distribution of academic practice, since they are positioned precisely on a boundary between regions and hence enable an effective switching between these regions. As such, they function as influential relays in between two regions. A 'browser', for instance, can be considered to be a proverbial clean slate that can be deployed in different activities: as a boundary actor, in the distribution of the map it is placed on its own and can, because of this position in between, be deployed in different distinctive activities.

Finally, Figure 4.8 displays a very different **infrastructure** than the first profile. Whereas in that profile the type of actor largely coincided with the regions enacted, in this profile digital, analog and human actors do not so much coincide with particular regions but rather are scattered more or less everywhere. Hence, whereas the infrastructure of the first profile was relatively regionally specific, the infrastructure in this second profile has a non-regionally specific distribution.

'Implications'

As these descriptions illustrate, academic practice in this second profile resembles that of the first in some regards, yet is also quite different in others. This also holds for the 'implications' of this form. First, as to the temporal dimension, for instance, a prefigurative dimension, in which the (academic) future is being rendered present, can be seen again: courses are being prepared (grey). Equally, and analogous to the first profile, if one considers the upper half of the map, it can be argued that these regions give shape to a *fragmented* timescape in which one activity after another is being performed in order to complete due tasks (e.g. communicating, performing a webinar) (cf. first profile). The lower (brown-green) half of the map, however, seems to give way to a sort of *hybrid time* in which academic and private (social/family) activities merge and thus form a timescape in which it is hard to make a distinction between them because they tend to flow through each other, as well as being visually closely related:

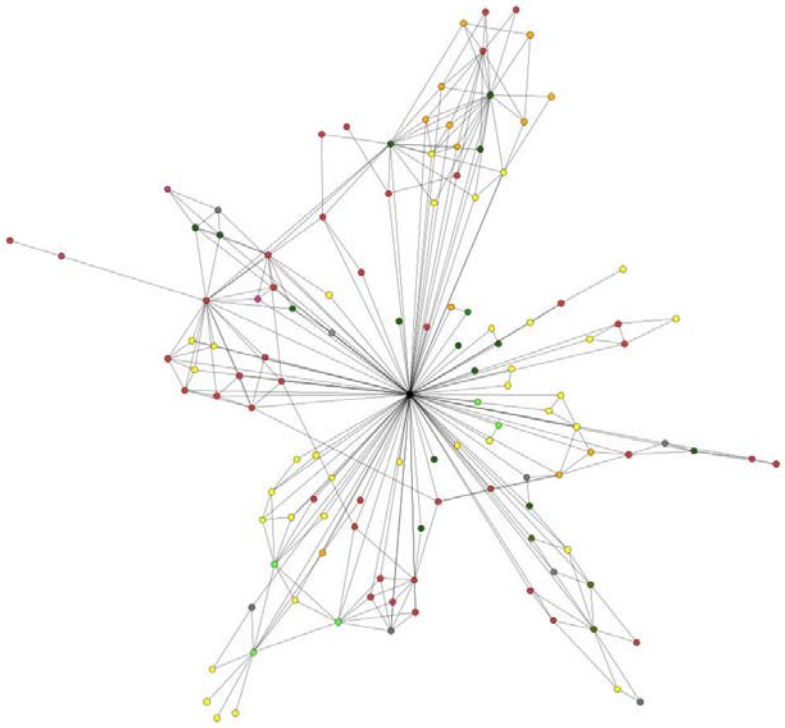


Figure 4.8

> Anyway… We had dinner then, and afterwards we did the dishes. And then it was about 6.
> **Okay. Was your husband at home as well?**
> Yes. And then we watched the news (…), and then… Yes, and then I checked my mail. At such times, I do that on the tablet, because that one is downstairs, and then I look for a moment. And sometimes, yes, students ask… Yesterday as well, there was a message, about the case number of a course. Well, I just give that then. And then I reckon, 'Well, you can move on now as well', you know? So, these things intermingle very much…

This excerpt, which reports (of a part) of the lower brown cluster and its connection with the blue communicating cluster by means of the web browser of the tablet, shows that family practices and academic practices tend to merge at some points in time. This equally applies for the green

region, where professional-social relationships with two ex-promotors were maintained: whether these are an element of academic or social activities is hard to say. Two digital actors play a crucial role in this respect and as such point to elements in the infrastructure that enable the conduct of both professional and social-family activities: the web browser of the tablet and the laptop.

Second, spatially conceived, the form of this profile gives rise to a *formatted* space: the blue communicating region (equally present in practically identical form in the two other profiles) clearly displays the formattedness of communication in the sense that one is communicating in a(n e-mail) space in which one has to do this and this in order to be able to establish communicative acts. In other words, constellations of digital actors make things possible but also *stabilize/fix* the form of this activity into a format. The same applies for the red webinar region, which displays not only the role Sandra had to take up in order for this webinar region to be effectuated smoothly, but also the stabilizing function of constellations of digital and digital-analog actors:

> Because a webinar implies doing four things at once, right? You keep track of time, you keep track of the questions you prepared, you have to listen to your interview partner. Uhm, that partner often has some slides on his laptop in front of him, slides he wishes to say something about…
> **And all of this happens on one screen?**
> Well, even stronger, since in addition to that you also have a tablet besides you. There is someone who receives questions or comments from the public, a public that you do not see. And those you receive on your tablet. And yes, then you have three cameras (…) You have to do four things at once, but you just go on, you know, because you cannot but do it that way.

Because of the emergence of such a formatted space, academic activities were localized in highly specific places where such formatting took place: a recording studio in the case of the webinar, a communicating place in which one e-mails, etc. Again, we can see an academic practice that thrives on the mobility of the academic herself, who has to thread from one functionally differentiated space to another. As far as the hybrid time is concerned, however, it can be argued that such hybrid time is enacted in a well-demarcated and very specific place, that is, the place of one's own home. This physical place was transformed by digital actors (web browsers), in the sense that these actors enacted a digital space in

which one could conduct, simultaneously, one's professional as well as one's family-social activities.

Third, in terms of the actors, this second profile clearly shows the importance not only of boundary actors (constituting a relay between adjacent regions), but also and equally of centering constellations of actors (e.g. software-colleague-technicians-camera), which both enable as well as fix the emergence of particular spatiotemporal constellations. Again, it could be hypothesized that such constellations point to typical academic spaces – but see conclusion.

Profile III

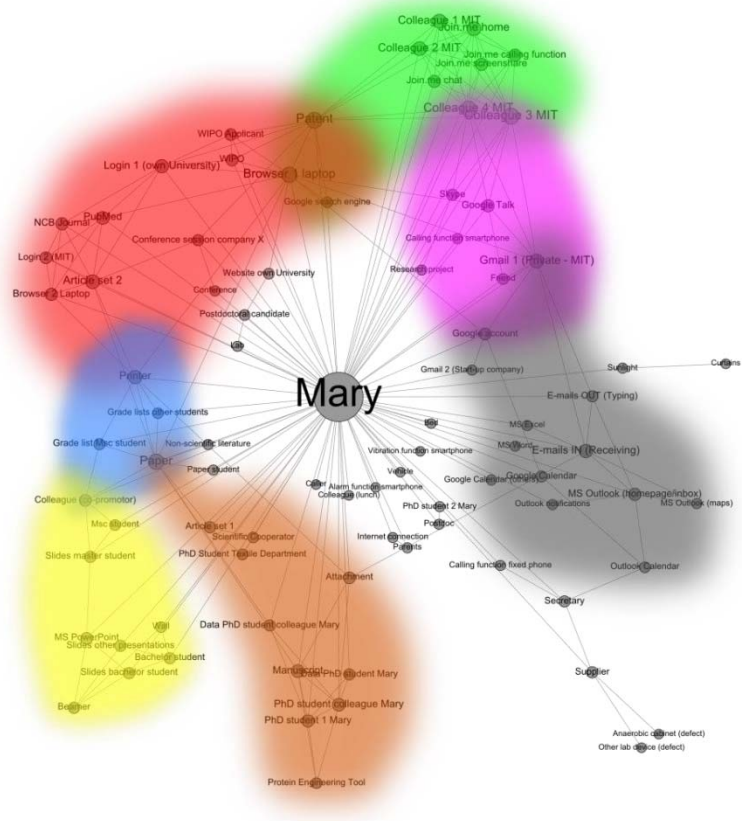


Figure 4.9

Form

In this third profile of academic practice the form of the three different maps is quite different from those of the previous two profiles: overall, most **regions** marked in Figures 4.9-4.10-4.11 overlap with at least one other region on the map. In the case of Mary, for instance, all regions are positioned in a concatenation and thus connect with at least one other region. Patricia's practice displays a concatenation of four regions, in addition to a separate private region (yellow). The blue region, for instance, again displays already familiar activities of communication, in which e-mails are read and assigned to particular folders, and attachments received in the inbox are opened by means of text processing software. This software was used not only for opening and processing these texts, however, but also to display preparatory documents (that were also printed on paper) for a meeting in which Patricia, one of her PhD-students and a postdoctoral researcher tried to write an outline of a book (grey). In the red region, another meeting between Patricia and a doctor-assistant shows how hotel accommodation was sought for a conference and how a study day was being prepared.

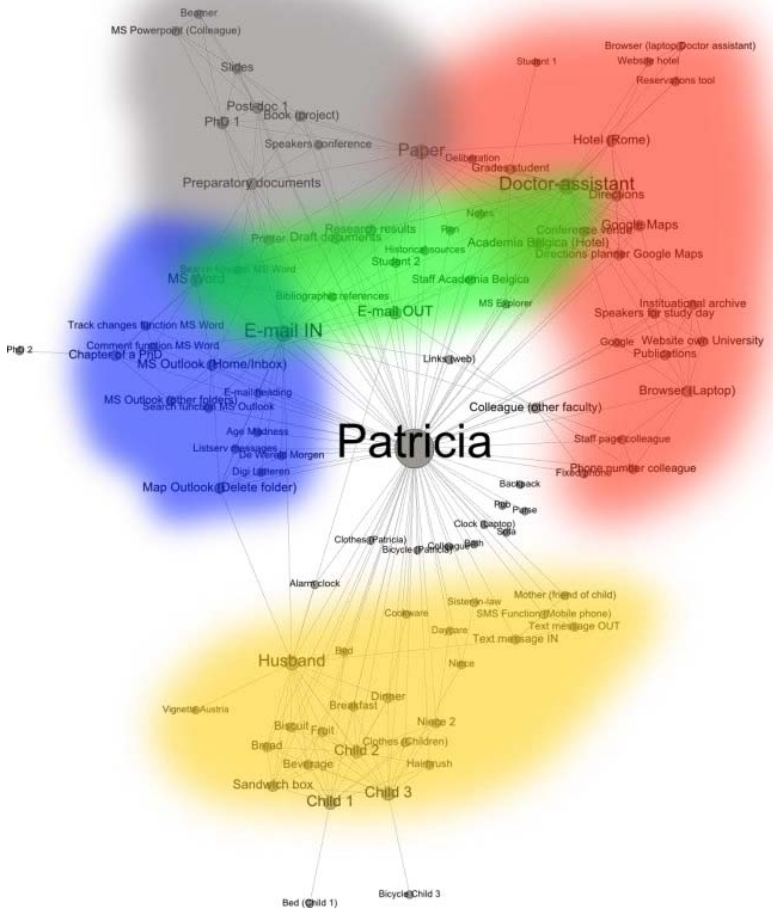

Beamer
MS Powerpoint (Colleague)
Slides
Poster
PhD 1
Book (project)
Speakers conference
Paper
Preparatory documents
Deliberation
Grades student
Hotel (Rome)
Browser (laptop Doctor assistant)
Student 1
Website hotel
Reservations tool
Doctor-assistant
Directions
Notes
Research results
Plan
Conference package
Google Maps
Printer Draft documents
Academia Belgica (Hotel)
Directions planner Google Maps
Historical sources
Student 2
MS Word
Staff Academia Belgica
Bibliographic references
MS Explorer
Institutional archive
Speakers for study day
E-mail OUT
E-mail IN
Track changes function MS Word
Comment function MS Word
PhD 2
Chapters of a PhD
MS Outlook (Home/Inbox)
Links (web)
Google
Website own University
Publications
Browser (Laptop)
E-mail reading
MS Outlook (other folder(s))
Search function MS Outlook
Colleague (other faculty)
Age Madness
Listserv messages
De Wereld Morgen
Digi Lanteren
Patricia
Staff page colleague
Phone number colleague
Fixed phone
Map Outlook (Delete folder)
Backpack
Purse
Clock (laptop)
Clothes (Patricia)
Bicycle (Patricia)
Alarm clock
Mother (friend of child)
Sister-in-law
Cookware
SMS Function (Mobile phone)
Daycare
Text message OUT
Text message IN
Husband
Bed
Niece
Dinner
Vignette Austria
Breakfast
Niece 2
Biscuit
Fruit
Clothes (Children)
Bread
Child 2
Beverage
Hairbrush
Sandwich box
Child 1
Child 3
Bed (Child 1)
Bicycle Child 3

Figure 4.10

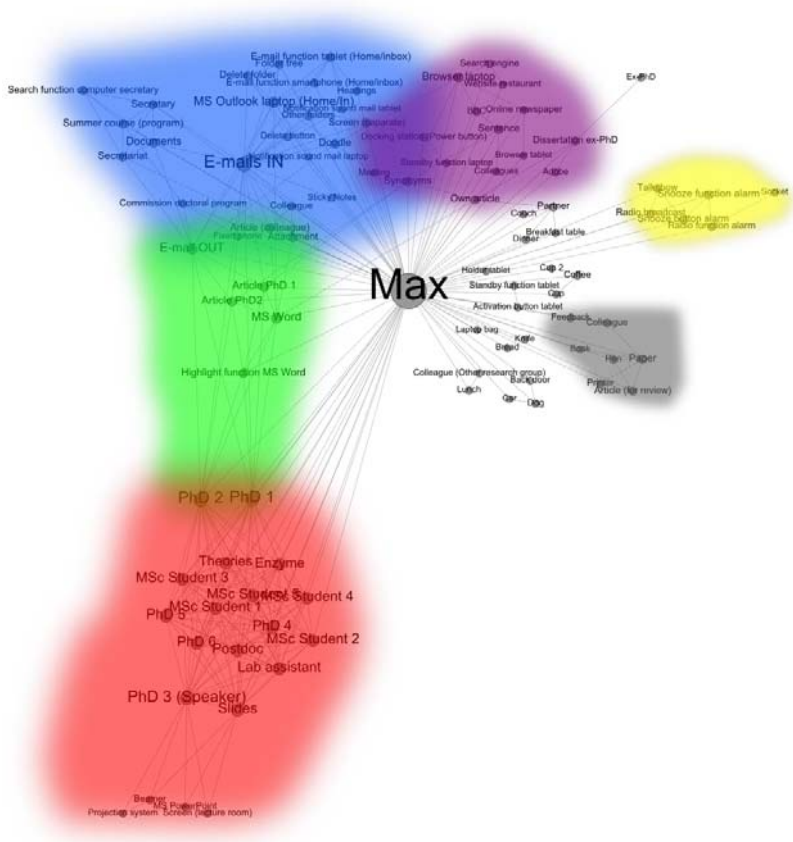


Figure 4.11

In addition to this concatenating characteristic, the regions in this third profile can, overall, be characterized as relatively **dense**. A clear example in this respect is the red region in Max's map (Fig. 4.12) that displays a seminar in which a PhD student gave a presentation about his research to other PhD students, MSc students, Max and some of his colleagues. Because of a discussion afterwards, in which many different parties talked with each other about that presentation, this region is very dense and positioned relatively separately. This is a consequence of the algorithm deployed, positioning connecting nodes relatively closer to each other than non-connecting nodes: since most of the actors present in this practice of seminaring (and these are not only human actors, as

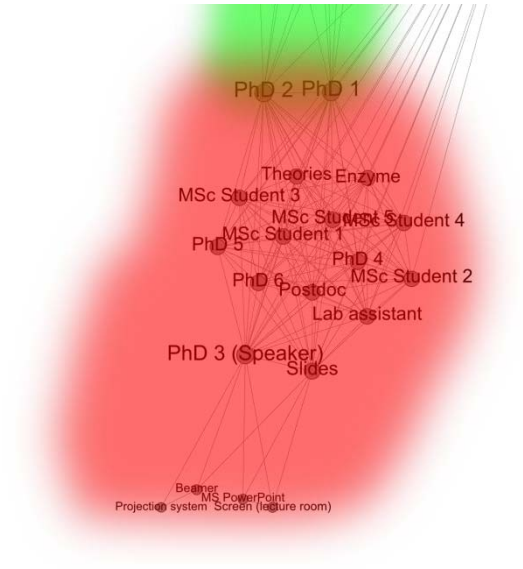


Figure 4.12

we can equally see some projection materials and some research-related actors such as an enzyme and theories proposed in order to explain the behavior of this enzyme) interact with each other, they are placed relatively on their own. But even in this locally densely-connecting cluster, two actors (i.e. two PhD students) are positioned in such a way that they connect to another region of the map. In sum, this third profile is characterized by dense regions, where the activity/-ies in that region coincide with activities in other regions, or (and this is the same point but slightly rephrased), where many different actors are deployed in different regions. This aspect of overlapping is distinctive compared to the two previous profiles, in which connections between regions were always situated at the level of relatively isolated boundary actors. Now, on the contrary, **interfaces** are established at the level of a *combination* of boundary actors. This makes it very difficult to say where one region starts and where another region ends, and hence makes the specificity of the actors taking part in a particular region hard to assign: to which specific activity did they contribute precisely? Since in this profile interfaces are constituted by multiple boundary actors, this is nearly impossible to say. Did the text processing software in Patricia's map contribute to communicating activities? Yes, but it also contributed to

the preparation of a book. Did the patent in Mary's map contribute to a virtual meeting? Yes, but it equally contributed to an activity of retrieving information. Moreover, the software, or the patent, never contributed *solely* to these activities, but always in joint connection with other actors that were equally deployed in more than one region. As such, in this third profile, collections of singular actors are acting as regionally-independent relays. Examples are the combination 'Patent-Browser-Search engine' in Mary's map, or 'E-mail outbox-Article-Attachment-Fixed phone' in Max's map. Additionally, as far as the **centers** in this third profile are concerned, the position of these centers (e.g. a printer, colleagues, an assistant, a word processor, e-mail inbox, synonyms, PhD students) is largely situated at permeable borders between different regions. As was argued in the case of paper in Julian's map, centers that can be equally characterized as boundary actors are especially authoritative: not only do they act as relays, enabling a relatively easy switching between two adjacent regions, but also they take up centering roles, since many proximal actors establish connections with them. In this sense, these centers have a decisive role in the conduct of academic practice on these particular days.

Finally, as far as the **infrastructure** of this third profile is concerned, Figures 4.13a-b-c display a scattered whole of digital, human and analog actors. As these renderings of the infrastructure of each network show, there is hardly any region to be found that contains exclusively one type of actor. On the contrary, each of these maps is an imbroglio of different types of actors that are positioned almost everywhere on the map, with a digital-analog actor often positioned in between digital and analog groups of actors.

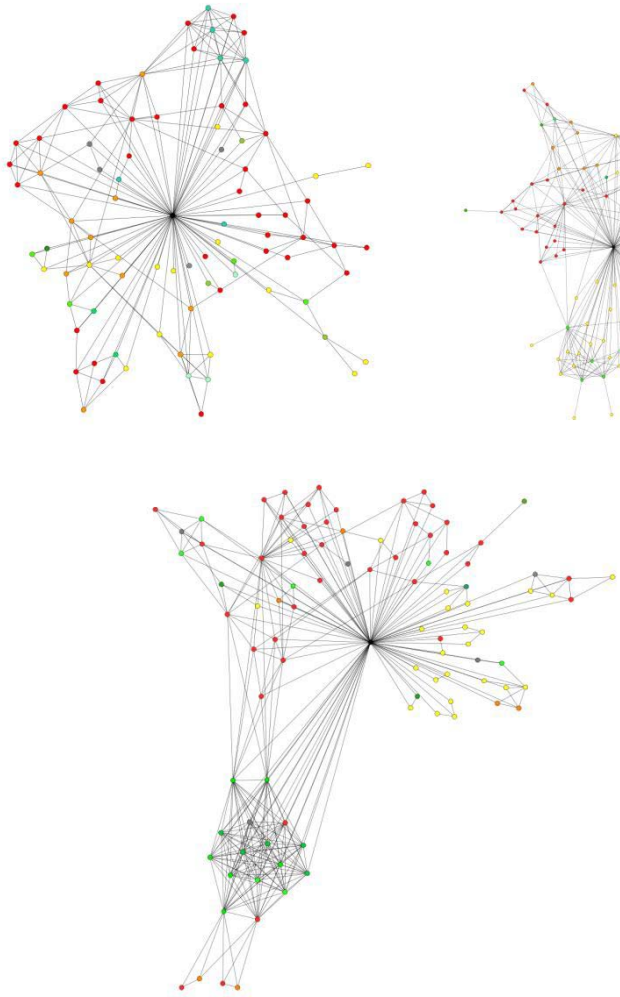


Figure 13 (a-b-c)

'Implications'

This third profile displays the significance of combinations of region-independent *actors* establishing interfaces between regions. Similar to singular boundary actors, these multiple interfaces enable a switching from one to the other, i.e. from one region (e.g. communicating) to an adjacent region (e.g. retrieving of information). However, as multiple

actors establish a permeable boundary in this profile, this makes for an academic practice that is constantly transmogrifying in the sense that performing one activity often simultaneously implies performing another activity:

> And then… I came to my office, and I saw that [the doctor-assistant] was luckily not here yet. That gave me a couple of minutes. And then I started eating my lunch. And… yes, what did I do then? I know I didn't even start reading his document, since I already knew: 'It is hopeless, I will just wait until he's here'. (…) [The doctor-assistant] did pass by, but we started later, it was already after 2pm. In the meantime… we talked through some practical issues. And I had to make a phone call at half past two. And then I gave him, you know, a little task to do in between. Well, a task, I was thinking: 'Oh, if you do this while I make the phone call'. (…) So at half past two I made the phone call, of which this is the residue *(points to a scribbled paper)*… Uhm, yes, I regularly look up some things, on the internet, such as phone numbers of colleagues. (…) I did that yesterday… when I had to call [a colleague].

Temporally conceived, academic practice in this profile is characterized by a *processing* time instead of consisting of harshly divided fragments (such as a to do list): a lot of different things (retrieving information, calling, …) can occur in one delineated timeframe, even within a firmly demarcated timeslot such as, for instance, during a meeting. As such, the present is being enacted as an actual *opportunity*, and hence as a plastic present, where many things can be processed potentially simultaneously or can be refigured according to the situation at hand. In other words, it is the present here that is constantly *refigured*, instead of (only) the future that is being prefigured – and this by means of a scattered whole of human, digital and analog actors. Indeed, the infrastructure of this third profile seems to suggest that it is precisely this scattered combination of types of actors that generates a simultaneity where academic activities can be conducted *anytime* (exception: lower half of Patricia's map, which displays a part of the evening exclusively dedicated to the family). This equally applies to the notion of *space*. In this third profile, space is being rendered *plastic* to the point that academic activities can be enacted almost anywhere: in the parental home (Mary), in the bedroom (Patricia), in the kitchen or the bathroom (Max), etc. In this third profile, then, space is localized in a *delocalized* manner in which most activities can take place in any kind of space, because of the scattered infrastructure of the

map that does not require the mobility of the academic herself. Rather, it is the mobilization of different other actors that allows the constitution of an academic practice potentially anytime and anyplace.

Coda

This chapter started with the argument that much research dealing with the current condition of the university is focused on either the personal self-understanding of academics or on contextual societal evolutions and how these evolutions impact the university and its structures. This study, on the other hand, focused on the *composition* of academic work. The point of departure was that academic activities are enacted in practice (rather than predetermined beforehand) and a specific interest in how the digital might play a role in this composition. In doing so, an atlas giving an account of this very composition was proposed, to try to render something very domestic, that is, the daily work of most people who will read this chapter, unfamiliar (Bourdieu, 1988). The atlas, then, displays a variety of academic practices that were divided into three distinct profiles. Naturally, these profiles should be considered not as being attached to a unique person (as if the practices and the spatiotemporal constellations in which Eugene was involved would always belong to the first profile and the practices and constellations in which Sandra was involved always to the second), but rather as a rendering of the homeomorphism of different academic practices obtained by visual analysis and along five topological dimensions, that is to say: of *typical academic forms* (see also: Masschelein & Simons, 2010).

When one looks at, reads and leafs through a traditional atlas, it is only at the end that it is possible to draw conclusions about the geography one was reading about and that one was able to see only aspects of in different maps. Similarly, then, what is to be seen if we now consider this atlas in its entirety? If it does not consider universities to be separated systems with clearly demarcated functions (e.g. research, teaching, service) or as referring to a unique idea, how does it conceive of academic work in digital times? We conclude this chapter by arguing that if universities are analyzed qua daily practices, it becomes apparent that what is typical about academic practices is perhaps that they should not

be considered on the basis of (collections of) internal actors or activities. Of course, actors bearing an almost natural 'academic' association with the university are to be found there (traditionally in the form of academic staff: PhD-students, colleagues, …), but one can equally see actors in the form of museums the university is cooperating with, industrial patents, public websites, pieces of software, and so on. This tight interconnectedness of actors from both inside *and outside* the university makes it difficult to say where the 'borders' of the university, as a clearly demarcated, self-contained institution, would lie (Barnett, 2013). Equally, this atlas shows that most activities performed are of a rather generic kind: preparing oneself for some future event; conducting or attending seminars; judging and evaluating students, colleagues and larger conceptual matters (e.g. projects); designing; convening; communicating. Most of these activities are hardly exclusively associated with academic practices, and hence the question could be raised what, then, would constitute something typically academic (cf. Fanghanel, 2012)?
Instead of there being typical internal actors or activities, perhaps what is specific about academic practices is rather to be found in the way all these actors and activities *associate* with each other in a specific *mode*. With the term 'mode', we denote those forms of association that are typical for the studied practices or, to put this more generally, the very common texture of different academic practices (Fenwick & Landri, 2012; Latour, 2007, 2010b). A mode, then, does not point to something like an 'academic habitus' – which constitutes a rather person-oriented point of view on academic practice (Bourdieu, 1988) – but precisely to what the profiles and concomitant forms in this atlas share: Which constellations of actors are typical of academic practice? Which general distribution(s) do academic practices have in common? Which types of academics emerge, and finally, what about the digital in these academic practices?

First of all, the atlas illustrates that many activities share one or more *boundary actors*. We have characterized these boundary actors as being relays, possessing the capacity to effectively switch between different activities. As such, these actors came to stand more on their own: they are not regionally-specific, but deployed in more than one activity. This signifies the enormous importance of these boundary actors: they gather (actors in) different regions together, and could thus be conceived as a *thing* (Latour, 2004). That is to say, not as a mute object, but precisely as

actors that *gather* different activities. There are no heroic, large-scale objects to be found here. Instead, the things in this atlas are pretty mundane: sheets, a web browser, a word processor, a student, etc. It is perhaps precisely in such mundane actors, however, that we can recognize a distinctive feature of the academic mode: it is a mode in which these actors come into being as *things*, in the sense that these actors are what the different activities share. In other words, it could be argued that it is only by focusing on actors and relations that we might eventually be able to get to grips with such associations (Latour et al., 2012): although a web browser, a word processor, paper, or a student are perhaps not often thought of as the most 'decisive' actors, they are precisely – as *things* – what holds different academic practices together. These things could then be considered to be prototypically academic: they *associate* academic practice, in the very sense that they bring this academic practice into union. Moreover, the third profile suggests that there are not only boundary actors, but also boundary zones: combinations of boundary actors that sound highly familiar (e.g. patent-browser-search engine; incoming e-mail-attachment-article-phone; two PhD-students) and that bring academic practice into union. These associating zones could then equally be conceived as being prototypical academic things, making it possible, for instance, that performing one activity at the same time means performing another activity. In the atlas, a rather rigid separation was made between interfaces (pointing to permeable boundaries between regions) and infrastructure (pointing to the sort of actors populating a map). In a certain sense, however, with regard to boundary zones it could be stated that interface and infrastructure collide. That is to say, it are for the most part digital actors that are to be found in these boundary (interface) zones, together with the academics' PhD-students. In other words, the distribution of actors in this third profile allowed an academic to switch from one activity to the other without having to physically displace herself, and this by grace of a mobilization of academic zones, that is, a combination of different boundary actors (mostly digital or PhD-students).

This distribution led, we argued, to practices in which time was rendered a *processing* character, in which one adapted constantly to the situation at hand, and space a *plastic* character, in which nearly any space could be rendered as a space fit for academic work. Eventually, it could be

concluded that all this requires a highly employable academic who at once addresses many boundary actors in order for academic practice to be able to 'function' and who is in a permanent *standby position* herself in order to process whatever task 'flows in' (Gúzman & Barnett, 2013). In contradistinction with the standby academic, the other two profiles showed academics who were operating as *task managers* in a timescape that was functionally differentiated – first this part of the to-do list, then this part, then that part – and eventually leading to a fragmented, 'shredded', whole. These shredded practices required an academic who was constantly on the move and going from one (equally functionally differentiated) space to the other, performing delineated activities that are either largely digital or largely analog. Additionally, in the second profile, we came to see an intensification of the functional differentiation in space, in the sense that the academic was urged to perform in a very specific manner, i.e. the academic was positioned in this academic practice as some sort of *circuit*, having to hold together many different (largely digital) components of, for instance, a webinar (which allowed for displacing oneself from one task to the other without having to move). At home, however, the academic in this second profile was not so much required to act as a circuit but rather as a *compromising* actor, and this in a rather hybrid timescape in which family-social activities coalesced with academic activities. This was due to a shared infrastructure: academic activities and private activities deployed the same (digital) actors. In sum, one might state that, whether academics are in a permanent standby position, compromising between family and professional activities, circuiting a particular practice or managing tasks, an academic mode seems characterizable as a mode in which academics are permanently busy (Ylijoki, 2013).

Finally, what about the digital in this academic mode? Hopefully, it has become clear by now that the digital is hardly analyzable as such: it flows in between other actors, exists only by grace of other analog, human and material elements, and is itself constituted by and composed of a great variety of actors. Perhaps this point in particular shows the significance of 'the digital': because digital actors are so entrenched in the conduct of academic activities, they are hardly analyzable on their own. It is probably here that the fruitfulness of adopting a relational sociomaterial stance is rendered most intelligible: instead of speaking about the

digitization of the academic profession – as if digitization would constitute a separate factor influencing the academic profession and the university – this atlas displays the advantages of considering the digital relationally and framing it in the everyday (Beer, 2005; Weller, 2011). Similarly, it has become clear that digital actors are often acting as a *thing* and are highly present in the contemporary academic infrastructure, but equally that they often take up the form of a *center* or passage point (the e-mail in- and outbox, software packages, printers, word processors, etc.). Instead of being important in their own right, as is often argued, digital actors only take up central positions in academic practice because other actors relate to these actors. We have conceived of these centers as being in an authoritative position: it is in and through the conduct of academic practice that such digital actors are *being made* important. As such, the proliferation of these centers implies that the academic herself is to a certain extent being *decentralized* because of this presence of a variety of digital (but not only digital) actors. Indeed, the atlas suggests that the academic mode nowadays is characterized not only by delegating authority to other academics, PhD-students and other colleagues, but also and equally to digital actors. The presence of these digital centers, in turn, implies a further mobilization of many other actors, be they digital or human. In sum, it could be stated that the presence of digital centers decentralizes the traditional human in academic practice, but that this very presence in turn gives way to the mobilization of other actors as well. As has been noted elsewhere, this suggests the importance of *digital fluencies* to be able to compose all of this (Beer, 2005; Thompson, 2012). That is to say, because 'the digital' takes up such a decisive role in contemporary academic practice, perhaps the academic mode is precisely characterized by finding ways to compose a digital fluency that is neither positioned exclusively in the person of the academic, nor exclusively in categories of activity domains such as research, teaching and service, which do not seem to fully capture what academic practice is (anymore). Rather, a continuous associating of all of these digital and other centers, boundary actors and infrastructures into what is often unreflexively called academic practice, seems to require a continuous searching, or the apt relational fluency, for how to compose the who, what, how and where of academic work in digital times.

CHAPTER FIVE:
WHAT SCREENS DO
THE ROLE(S) OF THE SCREEN IN ACADEMIC WORK[14]

We are finding ourselves in a spacious reception area. We came here by taking the elevator to one of the upper floors of a huge building that houses a Social Sciences faculty. The elevator gives direct access to this area, adjacent to a room where the secretariat can be found. The secretary is talking with a colleague, telling how little professors realize that some requests are simply not that easy to fulfill. Except for this conversation, barely understandable because of the door that is almost shut, the area is noiseless. It contains some sofas and a couple of chairs positioned around a table. We quickly realize that we have not entered a commercial building: except for the markers that got us here, the area itself is hardly branded and totally abandoned. There is no welcoming receptionist to be found. There are, however, many paraphernalia that suggest we do have entered a very particular, highly specific, place. For one, at least fifteen posters are hanging on two walls, informing passers-by of ongoing lecture series the coming months, of different master programs that could be followed, of different sorts of activities – upcoming and already passed. The most discerning feature of this room, however, is situated at a wall that is devoid of any posters. Instead, two large book display cases are presenting different books written by the people who are housed in the corridor adjacent to this area. A glass panel prevents to leaf through the books, so that we are only able to see covers, titles and authors. At the other side of the hall, we find a large and colorful painting that has something to do with the work that is being done here. The size of both the painting and the cases makes that visitors are drawn to them, inclined to give these presenting

[14] This chapter has been submitted to a special issue of the *European Educational Research Journal* on digital educational governance (Eds. B. Williamson & M. Lawn).

materials at least a superficial look, thereby getting some impression of the work that is conducted by the people working in the offices that are found in the long corridor adjacent to this area. In this corridor, most doors are closed, and this independent of whether someone is present or absent in the office. The only thing suggesting presence, apart from the occasional door ajar, is the artificial light that is sometimes lit, seeping through the frosted glass. [15]

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[15] This chapter reports of an ethnographic study conducted in two research centers operating somewhere in the field of the humanities. This study focused on the daily academic work that is performed in these research centers in general, and on how digital elements act and operate in these research centers in particular.
With these two research centers as the setting this contribution reports of, the ethnographic study was conducted in close relation with the methodology adopted in other ethnographic accounts of academic life, the most renowned of which are probably Latour's *Laboratory Life* and *Science in Action* (Latour & Woolgar, 1986; Latour, 1987). These studies were, however, more exclusively directed at the natural sciences and generally focused on how research in general and scientific facts in particular are constructed on a daily basis, thereby giving no explicit consideration to other scientific disciplines (the social sciences and the humanities) and to a large amount of what is equally being done at research centers nowadays (e.g. teaching, meetings with other faculty, etc.). If these other aspects of what academic work consists of are given attention in the literature, they are generally focusing on the meaning attributed to these aspects by the people involved in these activities (mostly academics or students) or on broad developments into which these activities can be situated (e.g. neoliberal doctrines imposing managerial thinking) (e.g. Lea & Stierer, 2009; Reynolds, 2010; Tuchman, 2009). This study, conversely, aims to scrutinize the often underemphasized aspects of daily academic work ethnographically into account as well (Packer, 2011). Similar to Latour's studies, this study adopts a flat, *sociomaterial*, approach that does not privilege one particular activity (e.g. research) or actor (e.g. human) above the other (for overviews: Latour, 2005a; Fenwick & Edwards, 2010). That is to say, before the actual conduct of the ethnography, we made no distinction between what is conventionally deemed to be an 'academic activity' and what not. Rather, the locus of analysis was pragmatically chosen, that is, the corridor that the two research centers share. This corridor was the nexus of our observations, being both the point of departure and the point to which we returned constantly.
Based on a mutual with the two heads of the research centers, we participated in different activities as they were taking place in the research centers for a period of three weeks (cf. Murphy & Dingwall, 2007). A further agreement was that only these activities would be followed that consisted of more than one person. Personal activities, conducted solitarily in one's office (such as writing a paper,

The corridor we are strolling through is the professional home of two research centers. These research centers are closely linked to each other in terms of the kind of research they are conducting (situated in the same discipline, but generally focusing on different topics), although they operate rather independently in that respect. In terms of education, the two centers are more interlaced: they are jointly providing a MSc program. Even though it probably never happens that all personnel is physically present at the same moment, each academic has her or his own personal desk. The professors in this corridor have their own office, whereas PhD-students and teaching assistants are generally sharing a room with one or more colleagues. As a general impression, there are about 10 professors working in these research units and about 40 other members of the academic staff, comprising postdoctoral researchers, teaching assistants and PhD-students.

We came all the way here, to this upper floor of the faculty building, with a very general research interest in mind: What is the role of the *digital* in what happens here, in this place, on a day-to-day basis? This interest is based on studies about (the nature of) daily academic work, where the digital often appears as very decisive herein (e.g. Blin & Munro, 2008; Jerejian, Reid & Rees, 2013; Weller, 2011), but at the same time on the observation that the concrete specificities and working mechanisms of the digital are most of the time underexposed in such studies.[16] In this

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answering emails, or making a telephone call), were not observed. In concrete terms of methodology, we observed different activities by means of three different notebooks: one acting as a logbook of the observed events; one consisting of the observations (written down at the moment of happening and reworked/-structured at the end of the day) and one consisting of trials that sought to give first preliminary accounts of what was observed (Latour, 2005a; 2010).

[16] This observation not only applies to studies of academic practice, but constitutes a more general way of approaching the role of the digital in educational practices: largely, 'the digital' is approached as being merely a neutral tool (a medium) to make use of, and consequentially in terms of the *impact* of such tools on these practices (Gere, 2008; Rogers, 2009; Verbeek, 2011). Analyzing the digital likewise often results in principled discussions in favor or precisely in rejection of the adoption of digital elements in educational practices (e.g. Bowen, 2013; Dreyfus, 2008; McCluskey & Winter, 2012).

study, we will not approach the digital in terms of its impact and concomitant opportunities or drawbacks, but rather scrutinize the so-called 'digital' in terms of the specific operations and working mechanisms of concrete *devices* (e.g. Decuypere, Ceulemans & Simons, 2014; Ruppert, Law, & Savage, 2013; Sørensen, 2009) In what follows, we are not going to talk about the digital as a general and neutral medium, but rather about the specificities and the concrete operations of *the screen,* as the prototypical device that is associated with the digital, instead. This focus on the screen emphasizes that we do not seek to give any explanatory account of 'the digital'. Instead, we approach the screen as an active device that performs particular operations (instead of neutrally transmitting/displaying some contents) that can be empirically investigated. Such an approach enables to scrutinize not only how screens are used and deployed in academic practice, but equally how these devices *themselves* act and operate, and which effects these devices, and the interplay of these devices with the academics present in a specific setting, generate.[17]

In view of this general focus, in this fifth chapter we present an account of the operations of the screen in daily academic work by describing different academic settings in terms of their *choreography*. The term has a long history, and is often invoked in order to comprehend social life in terms of movements and changes, instead of in terms of prefixed structures (Aronsson, 1998). Furthermore, the term is deployed in order to analyze the social positionings of different actors, for instance in the roles they perform in social life or how they act differently in public ('on stage') than in more private ('backstage') settings (Goffman, 1959). In this chapter, we equally adopt the term in order to refer to movements, changes and positionings, but do not exclusively focus on social interactions. Rather than that, we focus on how academic practice comes into being by the relational interplay between people and devices, and in

[17] This equally implies that the focus in this chapter is not explicit on other devices that are generally framed in terms of 'the digital', such as keyboard, mouse, etc. This is not to say that no attention was paid to these devices: in what follows, at some times we will explicitly point to the operations that these devices perform.

doing so stress how choreographies present how a particular academic practice comes relationally into being (Cussins, 1996; Gordon & Bogen, 2009). Actors (e.g. the screen, students, academics) are thereby not considered as atomic agents, but rather as being codefined by the relations they uphold with other actors (chapter 2; Latour, 2013). In what follows, we will describe these settings by focusing on three choreographic dimensions. First, the *scenery* of academic settings: which relations do other actors have to uphold with the screen in order for both to be able to operate (a question pertaining to the positions of these actors)? Second, the *roles* adopted by the screen: how does the screen come into being in these settings (a question pertaining to its different performances)? Third, the *script* that runs through these settings: how precisely do the screen and other actors act upon one another (a question pertaining to moments on which different activities are conducted in an (in)compatible manner)? Each dimension, as a typical composition of relations between actors, presents different (types of) relations between the screen and other actors present in various academic settings, but equally the mechanisms that these relations generate. The term 'mechanism' is used here in order to designate that we are not only interested in how precisely screens are made use of. Rather than that, we argue that specific ways of relating with the screen each time generate specific sorts of space and time (e.g. a spatiotemporal constellation in which only the contents of the screen counts) (Galloway, 2012; Kittler, 1999; Felt, 2015).

Scenery: Actors and relations

For now, we are following some academics of the research centers out of this corridor and move to several other places where they are heading to. More particularly, we find ourselves at several places where screens are deployed in order to display some things to an audience: we are at once attending some lectures, some conference sessions, a doctoral research presentation and some seminars devised for the students following the already mentioned MSc program. In this first section, the contents of these activities does not matter. Even the contents of the screen does not matter for now. Rather, we are looking at the *settings* – as arrangements of interconnected entities, such as the setting of the lecture

hall or the setting of the office – in which the screen is present, and at the relations of this screen with the other actors present in terms of their *scenery*. Where is the screen situated? How is it positioned in between, on top of, next to, …, other actors and more particularly, how do these other actors need to relate to the screen in order for it to be able to operate?

Even though the scenery of the rooms in which we find ourselves is always different, the position of the largest screen is similar in all of these settings: fixed, and at the very front of the room. In the doctoral seminar, the largest screen is a huge monitor solidly anchored to the wall. In all other settings, the screen consists of a projection on the wall: as long as the projector does not transmit any signal, all we see are painted bricks or a blackboard. This implies that the largest screen of the room is in need of at least one smaller additional screen driving it: it might be a tiny touchpad unit, the screen of a laptop or that of a fully-sized desktop. Equally the blackboard, as a non-digital and non-human actor, needs to be taken into account: should a blackboard be positioned over the place where the screen projects, we see that it is immediately shifted downwards, out of the way of the projection. Blackboard and screen appear, in other words, as counterparts in terms of what one can look at: in every event, between blackboard and screen, one has to choose. The two are never allowed to operate at the same time because they *cannot be seen at once* – except in the few instances where they have architecturally been designed in such a way that they are physically positioned *next* to each other. In all other cases, the blackboard is given way to the screen – until the sparse moments where it is drawn *through* the screen: we then see a projection that, all of a sudden, no longer counts. That is to say, even though we see two visual logics literally overlap at such moments, only one has its say: the slow composition of questions, definitions, schemes, templates, and so on, on the blackboard. Something similar applies for the relation between light and screen: light (daylight or bulbs) is hardly ever allowed, and only when this light does not hinder the light that is emitted by the projector (the projections)

In order to become acquainted with which relations need to be present in order for the screen to be operable, we do not only need to look at these physical and techn(olog)ical sceneries, however. In each of these

settings, there are equally (types of) *characters* involved; characters that equally (have to) relate to these screens in a particular manner. In the settings we find ourselves in at the moment – where presentation is a central feature – the first type of character is that of the *academic* up front (a lecturer, a presenting PhD student, …). Time and again, we witness that the screen is nothing without proper preparation. This is not only a matter of preparing one's presentation by means of presentation software; it is equally a case of preparing everything that does not directly belong to this software space (most of the time in the form of a slideshow) of the presentation: different browser tabs (minutely set so that they display (only) what is being envisioned to display); movies (stored online or carried around by means of a nearly dilapidated VCR cassette); series of pictures (selected in advance); etc. Without the preparation of the academic (as teacher), the screen would have nothing to display, or to say this otherwise: there is a 'before' before a large screen is starting its projections of what is found on the smaller screen. This 'before' stresses the observation that screens are not simply something one sits 'behind', as if they are only something to be looked at. Rather, being before the screen points to *temporal* aspects of a presentation, that is, to the preparation that needs to be effectuated before the presentation is conducted – both in the narrow sense of technical (connecting cables, dimming the lights) and in the broader sense of minute argumentative and aesthetic preparation, and in doing so ascertaining that the screen displays the *right* (that is, exclusively the intended) things. These preparatory actions imply that during an activity of presentation, what is displayed is formatted on beforehand into a piece of presentation software and hence that during the presentation this format needs to be followed: a format of a concatenation of bulleted slides, for instance, implies that the academic needs to abide to this format, and hence that she becomes *part of* the format she has prepared before. Furthermore, as soon as an activity of presentation takes the start (and hence, as soon as the format start to act), the screen urges the presenting academic to be *spatially* before the screen. This is not only because of the importance of upholding a *manipulating* relation with the screen (i.e., being able to instruct the smaller screen with buttons and mouse), but equally of upholding a *viewing* relation with both the formatted projections and the audience. That is to say, during

presentations the academic is constantly positioning her gaze between what is projected for the audience (by looking at the smaller screen) and this audience. In case this positioning of the gaze is being rendered difficult because of a change in the scenery, we immediately witness attempts to reestablish this twofold relation. At the conference, for instance, the small screen was positioned at the side of the room, cramped behind the participants of the workshop (Figure 5.1). Where should the presenting academic position herself in such a setting? At the front of the room, facing all participants but not able to manipulate the screen? At the side of the room, being able to manipulate the small screen but not able to face all participants? Somewhere in between? These academics didn't know where and were all in doubt with respect to how to position themselves in relation to the two screens and the audience: some were standing at the small screen in order to command the concatenation of slides, thereby not addressing a part of the public; others were standing at the front, thereby being forced to appoint somebody as "human remote control" that was instructed by commands – as if one was touching some buttons of the keyboard – as "next one… next slide please… next… oh no, back to the previous".[18]

The second type of character is that of the *viewer-listener*, who is addressed by the academic and the large screen up front (the audience). The position of these viewer-listeners is highly prepositioned: it is fixed by tables and chairs; and equally the position of their own devices (a small screen – laptop, occasionally a tablet or smartphone – or some paper) is mostly defined by the size of the table one is sitting at. The actors that constitute the audience cannot move, and neither can their devices: they are solidly anchored to fixed positions. As such, this points to a being before the screen in another sense: the viewer-listeners are prepositioned as being before the screen. This positions themselves as much as it positions the academic up front, who constantly has to position her gaze between screen and audience.

Even though the screen is highly prevalent in activities of presentation, its presence is naturally not limited to these settings. On the contrary, when strolling through the corridor, and peeking through some of the

[18] Double quotation marks designate literal utterances.

half open doors, one quickly realizes that each (occupied) desk contains at least one screen. Let us remind the reader that we are not finding ourselves in a natural sciences laboratory, where experimental manipulation of several objects and/or devices is a core activity. On the contrary, the academics in these two research units – although they are physically hardly discernable as two distinct entities: not only are they sharing the same corridor, they are equally located in the offices in a quasi-randomly distributed manner – are committed to qualitative research, effectuated out of the research center. In other words, for many researchers – and this especially applies for the doctoral researchers – the work to be done when present in the corridor chiefly boils down to "reading and writing". Occasionally, the visitor can see a notebook with field notes or a book on the desks. But this does not constitute the common denominator of the materials found on these desks: books might be absent, but each occupied desk contains a screen of some kind. For most of the doctoral researchers, whose professional tasks mainly consist of "reading and writing", the screen is generally positioned in the middle of the desk, in such a way that it dominates both this desk and the activities that can be effectuated at these desk: viewing and interacting with (i.e., being before) the screen is made particularly easy by means of such positioning, but this equally implies that it is a lot harder to invite a visitor to sit in front of them (see Figure 5.1).

The sceneries of the offices of most professors, on the other hand, are materially arranged in such a way that there are either two desks to be found – one nearly empty, the other containing a screen – or that the screen is positioned at the side of the desk, thereby making room for possible visitors. In cases where a visitor (a colleague, a student, …) is welcomed, this absence of a screen between the two parties allows to place something that is talked about (e.g. a paper with notes, a collection of brochures) in the middle of the table. Hence, whereas the architecture of rooms where presentation is the central feature or where doctoral students conduct their professional activities, features a dominance of the screen, offices of professors are arranged in such a way that *analog* actors (paper, brochures, …) are given the opportunity to easily take a central position and the screen is positioned more peripherally (and hence, harder to look at). Having such a peripheral position does not

mean that the screen is never adopted, however: it might, for instance, be consulted at the spot in order to retrieve some information (see below). In contradistinction with settings of presentation, then, since being before the screen entails such significant spatial and temporal consequences, in most offices of professors the screen is arranged in such a way that it is positioned peripherally: temporally (in terms of being next to the core activity of having a conversation) as well as spatially (in terms of position), it is arranged in such a way that it stands *besides* the activity conducted. This implies that both the screen and its before are turned away (the spatial before is being made peripheral), in order not to come in conflict with the 'before' of the paper, that is, with the positioning that is implied by the centrality of analog actors during a conversation.

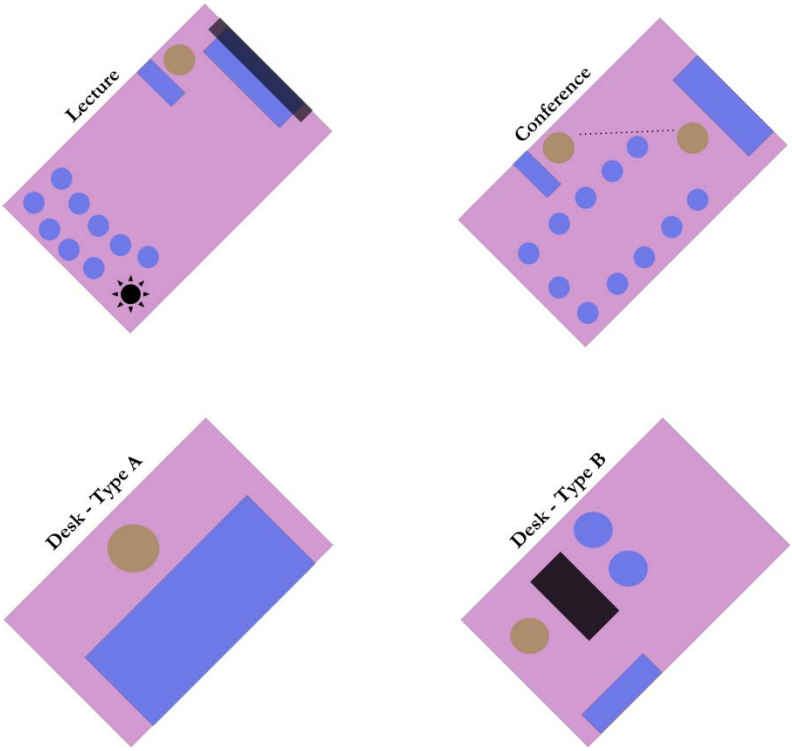

Figure 5.1

In sum, these sceneries present the actors present in academic settings (screens, paper, (different sorts of) viewers, etc.) and the relations

between these actors in terms of their *position*. Even though this is a rather narrow view that needs to be complemented with the two sections that follow, analyzing the agency of the screen likewise makes clear that a complex array of relations needs to be created and sustained in order for the screen to be able to operate. In that sense, this section equally points to the mechanisms at work when a screen is present in the sceneries of academic settings, and this in terms of the enactment of a *before* the screen, in three different manners. First, a temporal before that requires the establishment of preparatory time and that leads to a formatted presentation (where preparatory time fuses with the time of the presentation), or precisely the establishment of conversational time (where one talks about something and where this something (e.g. paper) requires the screen not to be there, because the positioning of the screen conflicts with that one talks about). Second, a spatial before that requires to be physically before one's screen in activities of presentation (because of the prepared format) or precisely away from the screen when having a meeting (where a potential conflict between being before the screen and being before the paper is avoided by placing the screen peripherally). Third, a prepositioned before for the listeners-viewers whose positions are fixed and delineated, which equally implies that the presenter needs to position her gaze between this predefined before of the listeners-viewers and the before of the screen.

Roles: Performance

In this second section, we focus on the different roles the screen adopts during different activities. This is a question pertaining to the different performances of the screen in and through different academic settings. Overall, we came to see eight different performances – always exclusively one at one specific point in time (i.e., these do not appear simultaneously), but often combining several performances within one and the same academic setting (i.e., one after the other):

1. Wall: The first performance of the screen is frequently found in activities of *projecting*, which often occur in settings where presentation is a central feature. Through projecting, more particularly, the screen comes into being as a virtual wall on which something is put in order to

make something *public* – often with the expectation for the viewer to gain some insight. Various conduits for establishing such relations are deployed; each conduit with a highly specific illustrating function: *text* in view of presenting a particular argument; *figures* in view of representing what was seen elsewhere (e.g. during the conduct of one's research in the field); *movies* as balancing somewhere in between (that is, presenting something, but often with a representative aim). In settings that have more of a private character (e.g. a talk between a professor and a student who makes his master's thesis under her supervision), this relation is often deployed by means of paper instead of the screen (see above, where we have explored this performance more fully in terms of its positional consequences).

2. Slate: This is a performance in which the screen exclusively appears as a device deployed for the effectuation of "work". Most of the time, when the term work is mentioned in this corridor, it amounts to activities of *typewriting*. In settings where typewriting is the central activity, the screen appears as a slate on which can be typed or on which words/paragraphs can be wiped clean, rearranged, and so on. As hinted above, we often hear PhD students mention that this typing (together with reading) is "all they do" when they are in. Professors, on the other hand, most of the time generally and purposefully establish this specific relation between them and the screen on the outside of this corridor: here, they "don't manage to get to their work".

3. Frame: At certain moments, the screen appears as something that can be deployed in order to *present* oneself, one's research center or one's discipline in an aesthetic manner. As such, the screen performs as a frame that is drawn around certain contents in order to present oneself attractively to the outside of the research center: deploying an aesthetic lay-out to the cover pages of a newly devised series of working papers; making sure one publishes "attractive" and "appealing" contents online (seduction of prospected visitors by embellishing some content); ascertaining one's texts have the proper keywords so as to be easily retrieved by search engines (technical seduction of search engines); etc. As such, in activities of presentation, academics think in terms of *promotion* and *opportunities,* or sometimes equally in terms of *safeguarding;* safeguarding not only the position of one's research center in the faculty

for instance, but equally one's discipline, by means of aesthetic presentation.

4. Billboard: At some points, the screen performs as a billboard. On a daily basis, this performance is hardly noticeable because it is such a common one. The screen chiefly performs the role of a billboard in activities of *exposing*, and the concrete result of such exposure is that constantness between different digital elements is inaugurated. Examples of such exposing activities are putting *logo's* and *emblems* on some content: putting a logo or an emblem on each slide of a presentation so that it recurs and recurs; presenting different ones in order to display all the organizations one is embedded in; etc. In doing so, slides are *branded* with a particular organization or institution, thereby placing a(n identifying) claim on the content of what is being displayed.

5. Grid: During activities of *exploring*, the screen comes into being as a grid. Such activities are tightly linked to the deployment of the world wide web in general and of search engines in particular. In this form, the screen is used in order to navigate to several virtual places (pages/websites) of which the precise contents is often not known in advance, but to which the world wide web and search engines show possible directions (e.g. search results) by creating paths (e.g. the list and order in which the results are displayed) one can follow.

6 Memory: The screen equally performs as an external memory, and more particularly in activities where *remembering* is of central importance. The screen is then adopted as a prosthesis that is capable of retrieving information. This largely amounts to minute and exact details that, more often than not, come in standardized form and varying from different research budget numbers neatly put in a *table* to references to journal articles neatly put in a *list* and to appointments fixed in a *schedule*.

7. *Window:* In activities of *looking*, the screen comes into being as a window through which one can peek as if one were physically there. This is the case when some aspect of the world is being drawn into the setting, either by means of recordings (e.g. in the form of pictures or movies) or by means of a live stream (e.g. video chatting with Skype).

8. *Sign:* Lastly, the screen equally comes into being as a sign. This is a recurrent form, mostly to be found in settings of lecturing or in rooms where one is a guest. By *directing* the behavior of its users to particular

wanted sorts (e.g. prohibiting any sort of activity as long as one does not enter the proper password) and away from undesired ones (e.g. prohibiting eating or drinking in a lecture room), the screen equally instructs its viewers to behave in some ways (and not in others).

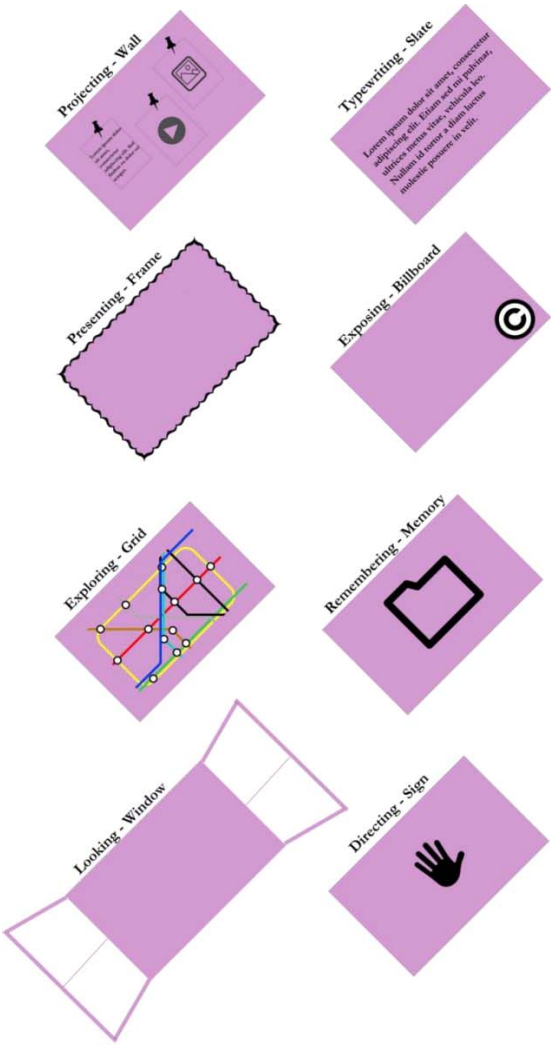

Figure 5.2

This second dimension of the choreography gave an account of the roles adopted by the screen in different academic settings, that is, on different performances of the screen. These performances pertain to the roles the screen plays in such settings, how it comes into being through the adoption of academics, and how it acts and operates – and hence not exclusively to how the screen is being made use of. Furthermore, these eight performances make clear why the screen is of such paramount importance in the conduct of many academic activities: not only because the screen is capable of taking up such multifarious forms, but equally precisely because it can take these forms *in one and the same academic setting*. In a setting where one prepares a slideshow, for instance, one can start by an activity of exploring (the screen then performs as a grid) in order to write some bulleted slides thereafter (screen as slate) that one embellishes thereafter (screen as frame) before eventually putting some logos on them (screen as billboard). In that sense, the screen acts as an obligatory passage point for many tasks in current academia – it can be a lot of different things – that has, as an effect, a tremendous amount of authority over the user – it can only be one thing at a time, and hence these concrete performances are in need of constant managing: first this, then this, then that. Temporally conceived, this enacts time as a constant *switching* between different activities: it is either one activity, or the other, or yet another, but there is no continuous transition between them – rather, each activity is delineated from the other (one can search the internet or embellish a slide, but not *at once*). Spatially, these different performances enact space as being something *multifunctional*: albeit one has to process one activity after the other, they can all be effectuated in the same space, that is, before the same screen.

Script: (In)compatibility

The focus of this third section is on the *script* of academic settings, that is, the interplay between the screen and other actors. This interplay is approached here in terms of compatibility between different activities (when the screen and the human actors act and perform in a synergetic way and to such an extent that different activities are taking place at once) and of incompatibility between activities (when one type of actor

is given the central position, thereby leading to dominance of one activity over the other). When do the screen and other actors operate in sync with one another? When are they out of tune?

Incompatibility

As argued, and for now we again find ourselves in more public settings, settings of presentation are often characterized by being 'before' the screen. This is not to say that this 'before' is always there, however: there are equally moments on which the academic up front breaks this relationship with the screen. These are no trivial actions: at the moment the academic physically detaches herself from the screen, most of the time she is about to make an important point or to bring in a central argument. This disconnection is a move *towards* the viewers, to which she comes physically closer and by means of which viewers are turned into *listeners*: by means of the academic moving to the fore and the voice that she uses at that moment, the audience is made attentive to some aspects that are consequentially rendered important. We see, in other words, how the academic brings movement (and her voice) into the setting in order to stress certain things. By doing so, the academic *competes* with the screen in order to grasp exclusive attention: she deliberately brings herself to the fore, thereby drawing the attention exclusively to herself and what she has to say. This constitutes an incompatibility between *seeing* and *listening*, where the academic puts emphasis on the latter by coming to the fore, and putting the audience exclusively *before* her (voice).

Conversely, there are equally moments on which *looking* takes the upper hand of *hearing*. At such moments, the academic *retreats* and gives the floor exclusively to the screen. Again, these are moments where movement is a central feature: at moments where the contents of the largest screen start to move, the academic is often inclined to go away from the front of the room. In doing so, she transforms from a lecturer into a viewer: generally, she displaces herself either to the side of the room or takes a seat in the public of other viewers (*behind* the small screen and before the projecting one). But not only the academic is changing positions because of a moving screen. Students close their

laptops (as if these are equally incompatible with the moving contents of the projections) and equally change their posture: they bend forward, and by doing so, almost exclusively direct their gaze towards these movements. In other words, as soon as the screen starts to move, it *absorbs* the possibilities of what can be done and who can do this: it is as if the possibilities of what can be done in a lecture room shrink to only one activity (displaying) and one active actor (the large screen). At such moments, where all human actors do not do anything except for looking at the screen, the screen is operating as a *collectively absorbing device* that takes the central position in the setting. This applies to even the most boisterous audiences – audiences of students that are afterwards portrayed by an attending academic as "behaving scandalously" – who then are equally and quasi-instantaneously drawn into the screen, absorbed by its movements. In both cases, where either the academic up front moves or where the projections start to move, the relation between the large screen and the other actors present can be interpreted in terms of an incompatibility between the activities of listening and looking: either the screen claims the central position, or the academic does – but they do not do it simultaneously.

Incompatibility between different activities is equally established at moments on which things do not go as planned, such moments on which the relation between the small screen and the individual viewer is so intimate that the audience has no clue about what is being meant precisely. This happens, for instance, at the already mentioned conference, where an academic is talking about his research activities whilst pointing to something on his screen, but where the audience gets to see a totally different projection. The presenter, unaware of this, continues with elucidating what can be seen on the screen – that is: with what can be seen on *his* screen. Consequentially, the public, seeing something completely other, has no idea what the presenter is talking about. The reader should bear in mind that this specific example is no side-effect of a traditional set-up, where an academic is presenting something with a projected screen in his back. On the contrary, most presenters opted to stand at this side of the room (and hence, *before* the smaller laptop screen), thereby equally having a clear view on the projecting screen without having to turn around. Because of this awkward positioning, this constitutes a good example, but largely,

moments at which the relation between the academic and the smaller screen is so intimate that the academic loses track of the larger setting of her presentation (that is, that there is an audience that cannot know what she is pointing at, or what is being displayed on that smaller screen) are highly prevalent. These are moments where the academic is drawn into her own screen, that is, where the screen is operating as an *individually absorbing device* that, at these times, absorbs the academic alone. We see, in other words, that the relation between academic and screen is in some cases so intimate that it creates a particular (individually absorbing) space (a sort of zone) and a particular time (a sort of presentism where only the contents of the screen, here and now, matter), in such a way that one is presenting *to* the screen, rather than to the audience. In that sense, this does not constitute an incompatibility between listening and looking, but between *talking* and *seeing*, where one talks to the screen, but forgets to see (that is, take into account) the audience.

A last type of incompatibility occurs in more private settings, where neither many people nor a large screen are present. During a research seminar that took place in a meeting room situated in the corridor, for instance, someone who was ill stayed home, but was attending this seminar virtually by means of Skype. She was projected on one of the laptop screens of one of the attendees (screen as window). However, despite that this laptop was positioned at a corner of the table, visible for most of the attendees physically present and constantly projecting a moving stream of the room in which the sick attendant was, during the seminar the laptop was hardly looked upon, and the (moving) screen did not receive any attention or consideration. At that moment, and despite such movement, the people who were physically present formed the focal constellation of the seminar setting, thereby rendering the person that was virtually present mute and obsolete. However, at the very moment the projected person started to speak, the sometimes quite lively discussion immediately started to falter – the spatiotemporal constellation of the physical seminar broke down – and everyone started to *listen* to this voice coming out of the computer (often resulting in long silences). This is a type of incompatibility between *hearing* and *seeing:* as long as one only hears speech of actors physically present, one forgets to see (that is, take into account) the moving screen.

In sum, incompatibilities can be purposefully established or not, but

always imply that some other actors are not being related to (see Figure 5.3), and hence, that at some points, the screen and other actors present are 'out of sync' with each other. Being out of sync implies that either the human actors or the screen are given a central position, leading to competition between these actors and the screen (for attention) for instance, but equally to, specific activities that take place (e.g. exclusive listening, looking, talking or hearing) and specific sorts of time (e.g. presentism).

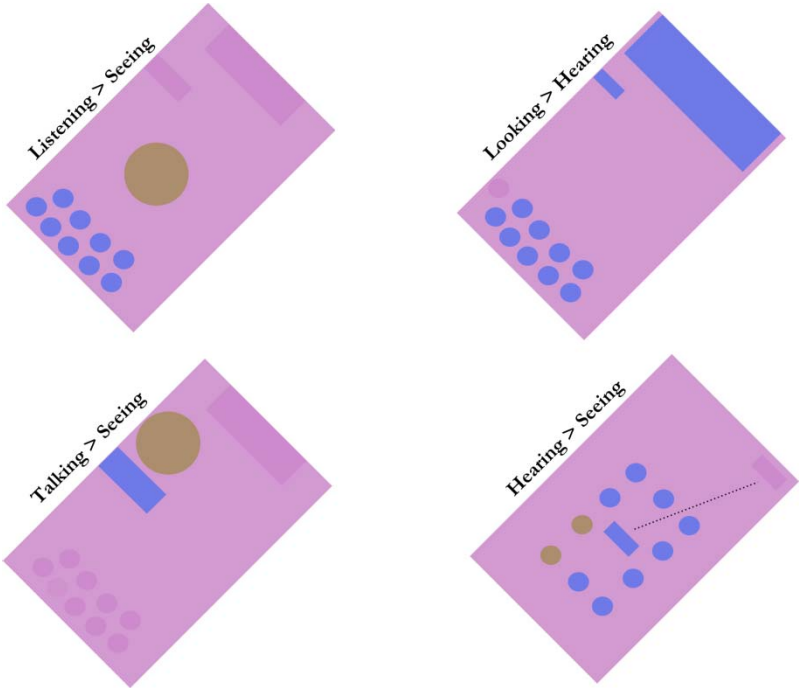

Figure 5.3

Compatibility

At other occasions, however, there are moments at which *compatibility* between different activities is established in such a way that the screen and other actors work synergistically together, that is, without one of

these taking the central position over the other. Sometimes, for instance, the screen *needs* movement of the academic in order for it to be(come) sensible. These are cases where the screen and the human actors present in the setting start to cooperate in such a way that they need each other in order to make sense. We observed this, for instance, on an occasion where a map of a country was being projected and references were made to different districts of that country. Since the audience was not acquainted with this country, however, they did not have any idea about which part of the map the person in front was talking about, that is, where to watch precisely. This issue was overcome by moving the mouse over the district, thereby drawing a fanciful circle around the region the presenter was talking about. At such moments, the screen and the academic merge, creating an assemblage in which compatibility is established between *showing* and *talking*: both activities are overflowing into each other here, establishing a synchrony between the academic and the screen in such a way that it makes the mutual effectuation of these two activities possible.

Such synchrony is not only being established between academic and projections alone, though. Let us, by means of example, now turn to an introductory course in which the theoretical assumptions of a very important person in the field – one of the "big names" of the discipline – are introduced. Through a couple of slides, where text is often accompanied by some pictures, the lecturer elaborates on a couple of general points. She announces that the purpose of today's lecture is to get to the assumptions that are present in the work of this big name, and that the students will all have to disentangle these assumptions by means of one of the big name's most famous definitions. "We are going to split into groups and will tease out different elements", the lecturer says. By inciting her own small laptop screen, she lets the large screen project the definition. It is other than most slides: there are no pictures here, just a plain white background. In the middle of the slide, in a huge font size, the definition is being projected. There is nothing more and nothing less to see than this definition. The screen is performing as a wall here, on which the definition is put, making these words public, sharing them with its viewers. The lecturer reads out the definition, slowly, word by word. Again, all of the students have directed their gaze at this slide show, although this time it is not moving at all. On the contrary, it is

(just) a bunch of still-standing words. "And now", the lecturer says, "this is your assignment". A new slide is being shown, on which three bullets are present, containing three different subtasks that the students have to fulfill. Some students take a picture of this assignment with their smartphone (at that moment performing as a window), as if they sense what is going to happen. Indeed, the lecturer returns to the definition, which will be displayed during the whole course of the group work. The lecture hall is buzzing with noise, and although the screen is standing still, as if it were contained in a frozen state, students keep on looking to this definition. They equally start to *point* to this definition, and more specifically, to different words of it. This pointing is all over the room: it rolls like a wave through the different groups that have formed in the auditory. In this process, where a compatibility between *looking* and *talking* is forged and where what is referred to and who refers are acting synchronically, without one claiming authority over the other, the definition is transformed from an abstract set of words/concepts into a *common reference space*: it turns from a bunch of words into a space that can be pointed at, referred to, made use of. Moreover, such common reference spaces do not even need to be projected: in trying to convince other students or making a case for a particular proposition, the students equally point to fanciful pictures that are not displayed anymore, that is, through pointing, they make reference to something that is not visible anymore; make these pictures present again; turn them into common reference spaces as well.

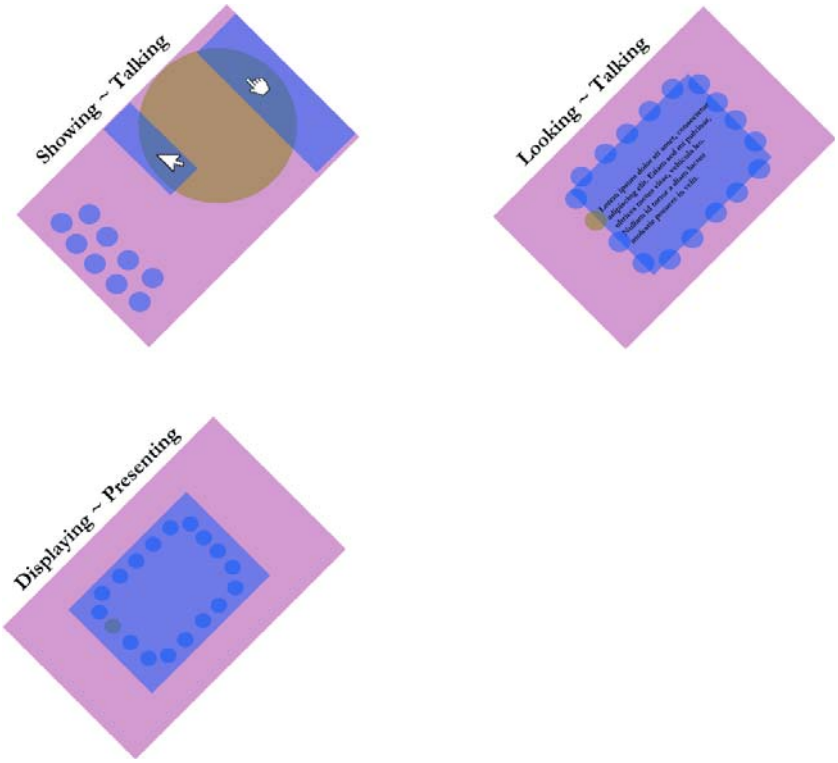

Figure 5.4

Compatibility is equally established by letting the screen make clear that something (a seminar, a conference presentation, a lecture, etc.) is (still) going on. Often, this is effectuated by letting the screen continue its projections, even if that what is projected has no relevance at all anymore: at many occasions, the screen is immediately put out of its standby position after it turns into a blue screen transmitted to the projector, or where the presenter, after seeing the traditional 'End of slide show'-message, goes a slide back, so as to make sure that something is (still) projecting. At other moments, especially during discussions after a lecture or during seminars, the desktop (rather than the slide show) of the presenter was displayed, every time renewed so as to prevent the blue screen of being displayed (and on the rare cases where the blue screen came to appear, the presenter quickly touched the mouse so as to revive the projection of the desktop). This equally applies for the attendees of such lectures or seminars: ostensibly, audience members with a laptop

can hardly stand that their laptop screen turns black, even when one is not taking any notes at that moment. Ascertaining that the screen keeps continuing projecting, *just for the sake of displaying something*, shows moments of compatibility between activities of *displaying* and *presenting* (or for the students, between displaying and listening) the screen and the academic setting itself: just by touching a button or by slightly touching the mouse, the space and the time of the activity that is going on (a seminar at the corridor, a lecture, etc.) is invigorated and prolonged. Rather than pointing to a 'before', this points to a sustaining of the presence of an activity: just by being there and by being slightly touched upon, the screen is prolonging the time and space of a certain academic activity. As such, it enacts an immersive space which demarcates that the here and now (the temporal 'during') of an activity is not finished yet and thereby sustains and invigorates the temporal constellation of the present, that is, of the present-ation.

The establishment of compatibility between different activities on moments at which the relations between the screen and other actors are synergistically 'in tune' with each other, are not confined to the lecture hall, seminars or conferences. We have seen such moments of relational compatibility between activities in more private appointments between professors and students, where both of them are discussing something (e.g. a note sent by the student) that is displayed at the side of the desk, thereby lively pointing to the screen or ascertaining that the screen displays what is being talked about (e.g. particular paragraph of a thesis); or in meetings with an administrator of the faculty, where the screen forms the middle of the conversation and where both the academic and the administrator point, refer, adapt, etc. what is to be found on the screen. In sum, rather than pointing to *where* such compatibility is being established, this section points to the observation *that* such compatibility between different activities in a variety of academic settings can be established, and that, at such moments, the screen and the human actors present in the setting are to be found in a synergetic situation. Consequentially, this leads to the inauguration of particular sorts of time (again, a form of presentism, continuing the 'during' of an activity, but this time on a collective scale) and space (e.g. a common space of reference; an immersive space) where screen and other actors synergistically act upon one another.

What screens do

In this chapter, we gave an account of how academic work is composed precisely nowadays, and more particularly of how the screen concretely operates herein. By conceiving of the screen as an active device that performs particular operations, this study is situated within the broader field of sociomaterial studies in education, that investigate how different educational assemblages are composed precisely by both social and material actors and which relations, operations and mechanisms are at play in such assemblages (e.g. Fenwick, Edwards & Sawchuk, 2011; Landri & Neumann, 2014). As such, this chapter offers a further exploration of the field that studies the agency of digital devices in educational practices, which has focused already on specific pieces of hardware (e.g. Thompson, 2012) or software (e.g. Kittler, 2004; Sørensen, 2009) and of specific activities such as typing (e.g. Vlieghe, 2014) or (e-)learning (e.g. Friesen, 2011), but not exclusively on the operations of the screen as such.

Next to this contribution to the growing field of digital studies, this focus on the screen has the additional advantage that it enables to come to a more profound understanding of some facets of academic practice that are increasingly being pointed at in literature about the current condition of the university, but that are difficult to articulate precisely. These facets all have to do with the intuition that the adoption of the screen in academic work has entailed some profound consequences, not only at the level of how academic work can be effectuated (e.g. working anywhere, anytime) but equally and more significantly at the level of what can be done during this effectuation. A first facet in this respect is the intuition of many that screens 'do' something and have some sort of agency of their own. It has, for instance, been argued that traditional practices such as lecturing, which constitute *'a period of time when an individual holds the floor to deliver a sustained argument on a particular topic'* (Collins, 1998; 21), face for that reason increasing challenges: there is no longer an individual who exclusively holds the floor now, but this individual increasingly makes use of screen in order to deliver a sustained argument. Additionally, over and beyond this screen on the front, many students now have a laptop with them (and hence, there is equally a

before their own screen, which might sometimes be in tension with the before inaugurated by the projecting screen up front or even with the 'before the voice' of the 'before the notes' one makes). Whether lectures have changed or not is a conclusion our analysis cannot lead to, but at the very least the *script* introduced concretely shows how the (agency of the) screen not only performs some operations in and on itself (creating common spaces of reference; drawing the world within; sustaining the spatiotemporal constellation of the activity of lecturing or precisely enacting a here-and-now in which only what the screen displays counts, …) but equally makes the other actors present in the lecture hall do particular things: it absorbs either one individual or a collective; it easily enables to draw the world within; it leads to competition between the screen and the lecturer in view of attention, being looked at and being heard; and so on. As such, the screen indeed plays a decisive role – not only in what is being done in lectures nowadays, but equally in what *can* be done. Even more, the establishment of compatibility and incompatibility illustrates that digital devices not only make human actors do particular things, but equally that there are moments on which the screen and other actors are in tune or out of sync. At moments on which compatibility is forged, for instance, different activities start to overflow into each other in such a way that making a distinction between them is hardly possible. Incompatibility between different activities, on the other hand, does not constitute a detrimental or unwanted side-effect of adopting digital media in one's activities, but is an additional manifestation of the more general observation that devices are not merely neutral objects or instruments to make use of. It are perhaps especially such moments that could add additional comprehension to the impression that the screen has altered typical academic compositions such as a (physical) lecture: screens perform actions and operations over and above their intentional deployment, and as our analysis shows, such actions and operations are equally of focal importance. If we gain a better understanding of such actions and operations (absorption, competition, etc.), we do not only gain a better understanding of the intricacies of the screen, but equally with respect to this general impression that certain things have changed by the screen (Allais, 2013; Masschelein & Simons, 2013c; Stiegler, 2013).

A second facet that is often raised with respect to the adoption of the

screen is that academics' work has become increasingly fragmented and busy, consisting of a processing of one (shredded) activity after the other. Often, such statements are uttered under the auspices of processes of increased bureaucratization, accountability and marketization (Guzmán & Barnett, 2013; Ylijoki, 2013). The analysis of the *roles* of the screen and its different performances, might equally be related to such impressions, but without having to invoke such overarching processes. In a relational vein as adopted in this chapter, not only does it become apparent that each different performance requires a highly specific type of user (and hence, each time a different way of relating to the screen), but equally that different performances can be present in one and the same setting (and hence that the screen comes into being as an obligatory point of passage for the effectuation of many activities). However, despite this omnipresence and this ability to take up different roles, the screen can only take up one role at a time, thereby requiring a constant repositioning of the academic making use of the screen. This might offer an additional view on the 'shreddedness' of academic work: if each role requires a different sort of user, academics need to constantly manage the activities that make use of the screen and hence to constantly switch between them (cf. chapter 4).[19]

Lastly, another often heard and more general impression is that the university in general and the professional lives of academics in particular are effectuated more and more online, by being so often 'behind' or 'on' the screen. This is a point that is, of course, not in need of denial or discussion, and these dimensions of being behind or on the screen and their consequences have already been intensively scrutinized (e.g. Edwards, 2015; Boon & Sinclair, 2012; Hayles, 2012; Wolfe, 2007). However, this account shows that by formulating the observation likewise, many dimensions of the agency of the screen are not being fully captured: instead of enacting a 'behind' the screen, this analysis (and more especially the account given of the *scenery* of academic settings) equally demonstrates the importance and consequences of what plays *before* the screen, both in one's office or at other locations, both spatially

[19] This might be a reason as to why one was so reserved with respect to observing activities effectuated alone in one's office: perhaps this shreddedness enacted by the screen not only implies a tight personal connection but equally a constant overflowing of academic activities with more private activities.

as well as temporally. This enactment of a 'before' by the screen sheds additional light at why it is that screens have so much authority in the making of daily academic work: because the screen enacts a before, and because we might not always be aware of the size and dimensions of this before, perhaps we are often already before the screen without fully realizing it.

CHAPTER SIX:
ACTION AT A DISTANCE – DISTANCING IN ACTION
ON THE ACADEMIC MODE OF EXISTENCE[20]

Prelude

Scene 1. *We have entered the upper floor of the building in which we are going to be a visitor the next couple of weeks. We have an appointment with the head of one of the two research centers that are housed on this floor.*

In the reception area adjacent to the long corridor, two MSc students are equally waiting for the professor. One student is a Spanish man born in the country he is in now, who has moved to Indonesia but who is now back in the country in order to study this particular Master program. The other student is a woman living in the French-speaking part of Canada, who is here for the same purposes. They are talking about the master's theses they are about to write, and more particularly about where they will conduct their fieldwork precisely.

When the head of the research center comes into the reception area and invites the woman to come on in, we start a conversation with the Spanish man. This conversation, between two people who have never met before, first entails some general small talk about the course of each other's lives. Quite soon, however, the conversation starts to revolve around the one person we have in common: the head of the research center we are both about to meet. The student is heavily impressed by this academic, characterizing him as an "exceptional person" - especially with respect to the many lectures given by the professor that this student has attended. He mentions that the lecture hall is nearly always "fully occupied" and that the professor succeeds in

[20] This chapter has been submitted to *Minerva: A Review of Science, Learning and Policy*.

> *"dragging along the public by means of his various anecdotes and personal stories". The professor we are about to meet is, according to the student, at once an "engaged lecturer" and a researcher who "has a tremendous amount of knowledge".*

Introduction

The current condition of the university has been widely documented over the last years, and in many respects the documented manifestations of this condition are – to put it mildly – not particularly encouraging. Increased administration; growing marketization; budget cuts and reduction of personnel; the diminishing of fundamental in favor of practical-applicatory research; publication pressure… the list is long and continues to expand (e.g. Barnett, 2011; Slaugher & Roades, 2004; Petersen, 2009; Torres, 2011). Even though all scientific disciplines are to a more or lesser extent susceptible to such evolutions, it has been argued that the consequences of these processes are especially detrimental for the humanities and for research of more fundamental nature – both of them not centrally directed at the production of economic gains. The commercialization of the university, it is often argued, has not only led to a posture that knowledge should be made profitable, it has equally led to a devaluation of what we commonly hold as 'academic' (Bok, 2003; Donoghue, 2008).

The aim of this sixth and last chapter is to contribute to our understanding of the current condition of the university by focusing on whether or not there is something about the university that makes that it comes into being *as* a university. By and large, the current condition of the university is investigated by means of one of the following two approaches. A first approach is theoretical in nature, and aims to come to an understanding of (the impact of) these aforementioned evolutions on the university as a whole. The university is then often theorized in terms of its unicity, and by stating that it is *not* a corporation, for instance (Nussbaum, 2010; Readings, 1996). The advantage of a theoretical approach is that it contributes to our understanding of the university as an *institution*, that is, as an organization which is directed at a particular

idea and with particular functions (Masschelein & Simons, 2013a; Simons & Masschelein, 2009). Most of the time, in the case of the university these functions are conceived to be at the level of the traditional threefold of research (advancing knowledge), teaching (educating skilled workers and critical citizens) and service provision (contributing to society and democracy) (Cummings, 1998; Macfarlane, 2011). A second approach conceives the university not through an institutionary lens, but rather through the eyes of the persons who are to be found in this institution. In this approach, the experiences, opinions, and sense-making of for instance professors and students are investigated (typically through interviews or surveys). The advantage of this approach is that it enables to understand what is experienced on a daily basis with respect to this current condition, for instance, how processes of marketization have a concrete influence on the daily functioning of academics, or how workload is being perceived precisely (e.g. Folker et al., 2009; Ylijoki, 2014). As such, this approach offers the opportunity to come to overviews of such experiences and opinions, and more generally equally enables to see the university as having intrinsic meaning and value for the people who are working there.

The approach that will be adopted in this chapter, conversely, is neither directed at the level of the individual nor at the level of the university's structure or idea. Instead, we approach the university as being 'in the making', rather than being made (by marketization or commercialization, for instance). This is not to say that we deny such influences and their consequences, but rather to say that the current condition of the university can equally be scrutinized 'from within', that is, by focusing on what happens in concrete practices (Hamon & Rotman, 1981; Bourdieu, 1988). How are such practices composed precisely on a day-to-day basis? How do academics (as the persons who 'work' in the university, i.e., persons who effectuate research, teach, have various meetings with other faculty and broader society, etc.) act in such practices? Such issues are not primarily pertaining to the role, meaning or intrinsic value of the university, but rather to how the university is concretely enacted in practice. Surprisingly few studies have been conducted that seek to come to grips with what it is that professors and other faculty do concretely, based on descriptions of what it is precisely that happens in concrete daily practices and this without invoking general overlying contexts or

structures (e.g. neoliberalism and marketization), personal qualification and meaning-giving (e.g. perceived workload, recognition), or critical-normative views that prescribe what the university should be for (e.g. fostering citizenship and democracy; advancing knowledge; educating students). Put otherwise, what has not received profound consideration is how precisely academic practices *come into being*, by focusing on how they are concretely conducted on a day-to-day basis. Such analyses do exist, but are most of the time to be found in ethnographic accounts of the positive sciences alone and, more precisely, in accounts pertaining to the conduct of natural sciences or technical research (engineering) – either effectuated in the field or in the research laboratory (for instance, Latour, 1987; Callon, 1986; Law, 2002b; Mol, 2002). These studies are all directed at the question of how 'science' is enacted through research, however, and not as much at how 'the university' is enacted through academic practices. In the vocabulary of these famous science and technology studies, one could state that academic practice at present largely constitutes an underinvestigated 'black box' (see also chapter 3).

The intention of the present chapter is to open up this black box. In order to do so, we visited two research centers, conducting qualitative research out in the field and broadly situated somewhere in the humanities, for a period of three weeks (fulltime). Albeit these centers function independently from each other, they operate in the same discipline and physically share the same corridor in the faculty building. By means of participatory observation, we followed scholars of different positions (professors, PhD students, teaching assistants) during their daily work (Packer, 2011). During this period, the corridor constituted the nexus of our investigations: this was the point where we started each day and to which we returned constantly after some activity ended (see also chapter 6). Furthermore, we made no a priori differentiation with respect to which activities to observe and which not: as agreed with the heads of the two research centers, except for individual activities (e.g. writing an article, reading a book, answering e-mails), we were granted formal permission to observe all activities that were taking place either at the corridor or somewhere else. Consent of individual participants was equally always informally obtained before starting an observation (cf. Murphy & Dingwall, 2007). As such, amongst others we observed: supervisory meetings between professors and MSc students; meetings

between the two heads of the research centers with respect to strategy and coordination; lectures; research seminars; conferences and study days some academics were attending; meetings with other faculty; and so on.

By means of this ethnographic study, the broader aim of this chapter is to come to an understanding of what it is precisely that qualifies an academic activity as 'academic' nowadays or to phrase this otherwise, what is it precisely that makes something academic and not, say, political, economic or religious. As the field notes excerpt above suggests, at least for persons on the outside of these research centers, the person of the academic involves something more than merely conducting scholarly research or publishing in peer-reviewed journals. But what is this 'more' precisely? How does that what is often unreflexively designated as "academic practice" come into being in concrete daily activities in this corridor? Such are the issues that are before us in this chapter; issues that pertain to what Latour (2013) designates as a specific *mode of existence*. The term is adopted in order to refer to the specificity of concrete academic practice, and hence to the issue of whether academic practice possesses something that is typical, and if so, what precisely then. More particularly, it not only points to the question whether or not there exists something as 'academic practice' as such and where such practice could be found, but equally and more importantly *'allows us to ask further questions than those of their presence and to be interested in their "ways of being" or their "modes of extension"'* (AIME, 2013). That is to say, rather than merely focusing on where (and moments on which) academic practice is to be situated, the central issue that interests us here is: *how* does academic practice exist nowadays? How does it come into being? As Latour has argued throughout his work, this is a question of *becoming* and hence not a question pertaining to an underlying essence or identity (as if we were to unveil the bare essentials of academic practice, the Holy of Holies), but rather a question pertaining to the relations that are established between different actors in a particular mode. This equally constitutes a question of *relating* (hence the term 'extension'): in order to characterize what is typical about a particular practice, one has to analyze which relations academics deem of importance to have. This is where the central importance of the notion of *attachment* comes in: what defines a particular mode of existence, Latour argues, are precisely what and who

the entities in this mode are attached to (people, things, concepts, etc.). Attachments designate that what sets a practice in motion: that what is deemed important, of value, and what one does not want to refrain from (ibid.; 1999a: 31). Attachments, hence, are what could be called the passionate interests that are typical for a specific mode of existence: interests in the sense of that what lies *between* ("everything through which an entity must pass to go somewhere" – 2013: 433); passionate in the sense of these things one does not want to let go of ("the degree of *intensity* of the attachment" – ibid., emphasis in original).

In what follows, we undertake an attempt in order to localize and characterize this mode of existence of academic practice. In order to do so, this chapter adopts a *sociomaterial* approach that, first, takes as presumption that nothing exists on its own and that is in this respect, second, focally directed at the *relations* that are established between different actors in different academic activities (Law, 2009b; Fenwick & Edwards, 2010; Feldman & Orlikowski, 2011 – equally chapter 2). In such a sociomaterial vein, not only did we not make any *analytical* distinction with respect to what would constitute an academic activity and what not; we equally did not make any a priori analytical distinction between different actors. Rather, we focused at the elations that were established between these actors in such academic practices. That is to say, both social and material actors were taken into consideration, and this without privileging one above the other. This not only stresses the point that materials do indeed shape academic practice and are as such active devices rather than mute objects to be used; it equally and more importantly stresses the importance of not confining analyses of academic practice to either its social or its material dimensions alone (e.g. Hodgson, 2014; Kittler, 2004; Lash, 2001).

The structure of this chapter is as follows. In order to identify how academic practice comes into being in these two research centers, we identify four *forms of attachment* that are characteristic of the specific ways of relating in these research centers. A first attachment, we argue, is an attachment to *generality and universality*, established by relating to particularity and singularity. Second, the mode of existence of academic practice is characterized by an attachment to the *research* one conducts and to the general *discipline,* in order to be someone oneself.

Furthermore, specific attachments to, third, common and isolated *spaces and times* that one inhabits, and fourth, to *originality* (by referring to the proper texts and concepts), are identified. Lastly, and wrapping up these four forms of attachments, we argue that an academic mode of existence is characterized by *distancing in action* – thereby conversing Latour's statement that the scientific mode is characterized by action at a distance.

Generality & universality: Purifying

> Scene 2. *On a two-day conference on which a professor and two PhD students of one of the research centers are present, two foreign researchers are presenting their work. The first day of the conference is drawing to a close, and both the panel of experts, positioned in a U-like shape, and a small attending audience, positioned at the back of the conference room, are increasingly looking exhausted. The presentation given by these two researchers is the last one in a slot of three; the slot being moderated by the professor we followed to here. The two researchers have prepared a paper which they read out alternatingly. The paper is about a concrete case that was investigated and analyzed, largely by means of data found online about this case. In addition to this (textual) paper, the two scholars have equally prepared a slide show, which is projected on the front wall of the room. The slides present – show – a variety of visual elements such as pictures of flyers and brochures, YouTube films and print screens of these YouTube films. All visual elements are directly related to the case at hand. Sometimes, however, the slides are primordially textually oriented, displaying bulleted lists of focal elements of their paper. The larger part of the paper is centered around this particular case, about which some more general arguments are derived. At the end of the presentation, the moderator mentions that the session was a very rich one, and ties up some elements that were made in the three different presentations. A concluding discussion with the entire panel is taking the start. Some general points are being raised, but most prevalent are questions about concepts deployed by the presenters, the particular cases that have been presented, and eventually also about their relation with the research discipline itself.*

> Scene 3. *In view of a master's course that is directed at getting acquainted with some main topics and concepts of the discipline by means of group work, one subgroup of students is having a preparatory meeting with the teacher of this course. The assignment of these students is to lead a session about the participatory method, a method of working that is often deployed by professionals in the field. At the beginning of this meeting, however, the students are raising some issues with an assignment that should by fulfilled for another course, given by the same teacher. For that other course, the students have to write a paper about a book they (all) have to read. The students mention that the book is quite inaccessible and difficult to understand. The teacher takes note of these concerns, but assures the students that this book is of tremendous importance: "It is a* classic*", she states, using a lot of emphasis. After having overcome these issues, during the preparation of this session, the teacher constantly asks the students how they are going to realize their general ideas in practice. She keeps on asking questions as: "How are you going to do this concretely?", "How will this work?" and "How are you going to ascertain that...?" At the end of the actual session, led by the students a couple of days later, she takes the word again in order to point to a seminar that will take place the next week in yet another course, where a guest professor will listen to a short presentation that each student is expected to give. "I just want her to know you and vice versa", she says, "It's an honor to have this professor here. It's a* big *person".*

Where to start a study about how academic practice comes into being? As argued, a proper way in is to consider the concrete settings in which academics are situated; that is, to start in medias res (Latour, 2005a; Fenwick & Edwards, 2010). If the two presenters at the conference – and they are not alone: deploying visual elements happens nearly everywhere and every time – mobilize many visual elements, for instance, what does this point at? Basically, this demonstrates the importance of *showing* – indeed it is a slide *show* – particular aspects of a setting (a case) one has investigated, and of which one is presenting several aspects at that moment. This showing is not a trivial action – as if one would merely demonstrate what one has seen. Rather, the process that is specifically at work here is the deployment of *particular*

exemplifications of what was witnessed during one's research activities, not only in order to convince the attending expert panel, but equally in order to make sense of that what one is talking about at that moment. A series of pictures, for instance, then does not only operate as a showing device; it equally functions as a *particularizing* device. By particularizing – that is, by showing highly specific aspects of that what one is talking about – an argument that is by itself already centered around particularities (that is, a *case*) is gaining in authority: the *particularization of the particular* makes it possible that some *general* arguments about this specific case can be made and that it can be embedded in and related to conclusions and findings of other studies. In other words, this constitutes a twofold operation. On the one hand, something is particularized in order to make a general statement. On the other hand, this general statement makes that the particular (e.g., a case) is departicularized: it is made into an instance of something other (a broader phenomenon; a widely recognized evolution; …). Computers, and more especially screens, play a decisive role herein: by means of their capacity to project such particularities on a given setting, they operate as an active interface. By means of their capacity to project these into series, or more appropriately, into *carrousels* of visualizations (often in the form of a show, or a parade, of visuals), they enable to project a profusion of particularities, in such a way that the legitimacy and the objectivity of the presenter's argument is rising. In doing so, the activity by means of which one attaches oneself here to generalization is an activity of *purifying* particularities, and this not in the sense of stripping something to its essence but in the sense of increasing the concentration of the argument one makes. By particularizing the particular (in order to make a general statement) and departicularizing it thereby in one and the same process (making it an instance of something other), academic practice comes into being here as having an attachment to the central concern that what one generally states is 'right', that is, in accordance with what one saw (in the field), but equally that what one states is not particular as such: it is an instance of something other. In doing so, one's statements are increasingly concentrated: they gain more value and meaning in as far as one succeeds in deploying the particular (carrousels of specific pictures) in order to make a general argument (an instance of larger processes at work, for instance).

This tight clinging to generality by purifying particularities is additionally exemplified by the central importance of *anecdotes* and *stories* that pertain to the research one is conducting. Presenting such an anecdote or story here could compromise the anonymity of the setting and/or respondents, but largely, both anecdotes and stories are to be found on many different times and at many different places: they are used in conference presentations and lectures, during coffee breaks, in research seminars, and so on. These anecdotes and stories act, furthermore, as way more than only being illustrations tied to a general point one wants to make. Rather than that, it is the other way around: *without these anecdotes and stories, there would not be any general point to be made.* By telling about one's experiences in the research field – this again constitutes a particularization of the particular: the particular case is further particularized by coining one's own experiences to it – a similar double operation is inaugurated in this respect. First, the instauration of tangibility about what one is talking about (and therefor nearly always uttered at the beginning of a lecture, conference or seminar and continued throughout) so as to ascertain that one makes claims and arguments that are right. Therefore, these stories are not randomly chosen: they need to be *right* and apt for the specific occasion. Second, the generation of a specific kind of *objectivity*: by means of telling or reporting about particularities one has been confronted with, the kind of objectivity that is generated in these academic practices is about the level of detail one is able to generate, the amount of different viewpoints one is able to incorporate and the way one is able to transform both of these into *general,* concentrated and pure(r) claims about the particular, and hence not/less about the establishment of cold, solid and universal scientific facts (Venturini, 2010).

Making use of specific elements is not confined to the purification of the particular and a concomitant attachment to generality, however. As both the first and the third scene illustrate, academic practice can be equally characterized by means of its attachment to *universalities*. Again, these universalities are not 'just there': universalities need to come into being, and this happens through *revering* singular actors. That is to say, by and through revering, at first singular actors are highlighted, which might be another academic (a "big person"), but equally some work an academic has produced (a "classic"). Put otherwise, by and through revering,

singular academic actors come into being: *this* person (and not another); *this* classic (and not another). At the same time however, this implies a purification of this singular (a colleague, a book) – this time not into a generality but rather into a *universality*: something, or someone, singular that other actors are expected to equally and universally be in reverence about. That is to say, academic practice is equally characterized by purifying singular actors (a human, a book) into universal *eminencies* (in the form of a name, a title). Again, this is not a question of essentializing a human into a name or a book into a title, but rather a matter of concentration of what one says: names and titles are a concentration (of a singular academic into a name, of a singular book into a title) that enables to revere singular actors *as* universal eminencies. By this act of purifying what one is revering, these eminencies are thereby endowed with a substantial amount of authority (rather than objectivity): these eminencies, coined to an actor out there, are expected to be treated with awe and respect.

Research and discipline: Authorizing

> Scene 4. *In a well-attended session, a PhD student is about to present some preliminary research results of his study of a particular case. Since he is here as some kind of guest speaker, he first introduces himself and states that he "effectuates the research of professor X".*
>
> Scene 5. *An academic has just returned from a conference. He meets a colleague in the corridor, who asks him how his presentation at this conference went. "Very good", he says to her, "I have received very good comments, especially from Y". His colleague affirms that it is tremendous news that Y (a professor from abroad) was positive about the project. Y has good relations with the research centers, and the colleague puts forth the possibility that Y could be invited to pay a visit at the corridor.*

These two scenes deal with individual research and how one understands oneself in terms of, and positions oneself in relation to, the research that one effectuates. In the fourth scene, one conceives of this research as being ascribable not only (and even not chiefly) to oneself but equally to

a coordinator of the overarching research project one is involved in. In doing so, one *authorizes* the work one conducts (in this scene, as a PhD researcher) through the name of somebody other (X). The same applies for the fifth scene, in which personal research is equally authorized, this time by coining it to the opinions of somebody other (Y). By being attached to one's own research projects, what is established here is a double process of authorization through (de)personalization. First, by relating one's research to *other* persons, this research is being depersonalized in order to authorize what one is doing: it is made less of oneself, and more (or equally) of somebody other. In other words, this depersonalization is, second, at once a *re*personalisation: by authorizing one's research *through* somebody other, not only is one's own research gaining in authority, equally these other persons are being *rendered* important likewise.

> Scene 6. *We are strolling along with two academics to the coffee room, which is shared with another corridor and where other centers of the faculty can be found. In this other corridor, a wall contains a bunch of articles, published both in scientific journals and in popular newspapers. Our attention goes to this wall, but quickly we are interrupted by one of the academics. "These are from the other centers", he says. "Look at that. Articles. At least we have a fully-stuffed bookcase", he jokes, referring to the collection of books that is displayed in the reception area of their corridor.*
>
> Scene 7. *During a conversation between a professor and a student who makes his master's thesis under his supervision, by reading through the notes he brought along, the student elucidates his research proposal and proposes his methodological framework. The professor listens to the student, and after the student is finished, he judges at the spot: "The size and scope are not big enough for a study in our discipline", he says. After a vivid discussion between the two parties, in which different other options and hypotheses are explored, the professor proposes to broaden up the scope, and mentions a few concrete possible directions. "This way"*, he states, *"you will be able to conduct a study true to the discipline. There equally is many literature in our discipline on this respect".*
>
> Scene 8. *The faculty is planning to announce a vacancy for a full professorship. Within the faculty, there is a lot of debate as to which center*

> *this vacancy – which has a strictly described orientation and general topic – should be awarded to. In a meeting between the two heads of the research centers, they are discussing whether or not this is a viable option to pursue. "I want this vacancy to be assigned to our discipline, and not again to that other discipline", one of them states, "it should be awarded to our discipline". He continues that "this is one of the only ways to let the discipline grow in this city, since this is going to be our last chance in the years to follow".*
>
> Scene 9. *The reception area of the corridor is not only filled with books. It equally contains over 20 posters, about activities upcoming and already passed, at this corridor but equally beyond one's centers, in the country or abroad.*

The scenes presented here (but equally hinted at in scenes 2 and 3) again point to an authorization, this time not of one's research by relating it to (that of) another person, but by soundly attaching oneself to the larger *discipline*. The general discipline one situates oneself in, is of central importance and manifests both in the activities conducted at the corridor and in how one presents oneself to its visitors (e.g. by means of posters that equally point to the outside of the research centers, in order to make clear what happens *inside*). As such, this discipline is something more than a name to qualify the academics in this corridor (as a general term that would denote the assemblage of 'center + center'). It constitutes an authorizing attachment: not only does it create a collective (*our* discipline), this collectivizing at once constitutes an inscribing of what can and cannot be done, and hence, authorizes oneself as somebody *within* that discipline. Collectivizing, in other words, implies something that needs to be nourished and protected and what one deeply cares about, but equally and at the same time implies an authorization of oneself and of what one can and is allowed (or deemed valuable) to do (cf. Dall'Alba, 2012; Simons & Masschelein, 2009).

In sum, the general point that can be made here is that the academics of this corridor are constantly sustaining and managing the *insides* of what they are doing, by authorizing it via the *outside*. That is to say, no matter when we are talking about one's own research, the center one belongs to or the discipline one is situated in, what is at stake are operations that

authorize what one does and cares for. Authorizing one's own individual research through a larger research project led by a particular professor, for instance, is not so much a reduction of one's own agency as a researcher. Rather, it constitutes an act of *inscribing* it in a larger whole, under the name of the (authority of this) professor, and thereby at once an act of *personalization* which enables to become someone oneself. The same applies to disciplinary interest: being 'passionately interested' about one's discipline is not so much a matter of not wanting to engage in interdisciplinarity as it is a means for ascertaining that the discipline in which one is acting, is at once sustained and reinforced, and for oneself, in order to be somebody within that discipline.

Spaces and times: Inhabiting

Where, and when, are the academics populating this corridor to be found? The academics here have a large concern – a profound attachment – with the proper organization of their activities, and hence with the sorts of space and time one *dwells* in: daily routine activities are so dispersed and largely require individual efforts (e.g. giving a lecture, supervising students) that the creation of *shared* space and time is something that needs to be watched over constantly. An illustration hereof are the "savage slots" that these two centers share: in operation for not a very long time and proposed by a head of one center, each academic in the corridor is expected to keep these slots, which are recurring on a weekly basis, non-occupied in one's schedule. The finality of these slots might differ: there might be a staff meeting, a seminar, or some other activity scheduled. Yet, what all have in common is precisely that these activities are designed and shaped in order to establish something that is *common* – even though, as is often mentioned, the reality sometimes differs from the original intention of these slots. Another example of the instauration of common space and time are reading sessions, largely at the initiative of PhD students and with the intention of reading a seminal book together. Again, this is not only in view of the contents of this book, but equally constitutes a deliberative attempt in order to create and inhabit common space and time.

Overall then, being physically present together is not only considered of importance; it equally does not come about naturally and needs to be *organized* and actively *shaped*. This designates a profound attachment to common spaces and common times: academic practice emerges here as a practice that is characterized by dwelling into that what is common. However, despite the importance attributed to inhabiting such spacetimes, most (but not all) professors mention that such commonness is, in fact, a constraining factor when it comes to conducting activities that they themselves call "work" (cf. chapter 5; Guzmán & Barnett, 2013). Deliberately dwelling in common spaces and common times is thus not the only concern:

> Scene 10. *At the beginning of our stay at the corridor, we enter the room of a professor in order to ask whether or not there are certain activities the coming weeks that we can take part in. The professor turns to his computer screen and opens his calendar. After having made some arrangements for this week, we arrive at the next week. There are hardly any colorful beams displayed, suggesting an activity will take place somewhere next week. "Next week I have nothing for you, though", the professor says. "As you can see", he states whilst pointing at his screen, "I have moved aside everything to above and below"* [i.e. the next and the coming week – authors]. *"Next week is a writing week. I need to write a paper that is on my desk for way too long already".*

This is only one scene, but the prevalence of remarks pertaining to isolation is paramount. For academics, it seems as if separation needs to be established in order to inaugurate a space and a time that is *productive*: productive "work" – most of the time in the form of writing – requires isolation and solitude, a withdrawal from that what is common and hence a spatial and temporal separation from the corridor, one's colleagues and the visitors that frequent this space (Ylijoki & Mäntylä, 2003).

In sum, even though the academics in this corridor are constantly busy and go from one activity to the next, all day long, there nevertheless equally is a tight clinging – a tight *attachment* – to isolated spaces and times, and hence to the effectuation of activities that are considered to be of focal importance, but that can be hardly performed when dwelling

in the corridor itself. These activities nearly always amount to *writing* – an activity that can be more efficiently performed when at home. In other words, it could be stated that there is an operation at work here that cuts speaking from writing, and that both have their delineated time and space. Notwithstanding that this dwelling in isolation – this *detachment* in order to be able to *attach* oneself to activities of writing – is desired and actively sought, one equally is firmly attached to inhabiting *common* spaces and times, which are actively organized and where the importance of being physically present is concretely being given shape. In these common spaces and times, the central activity consists of speaking and listening to what others are saying. It is precisely this constant oscillation between dwelling in solitude and common engagement that von Humboldt (1810) already pointed at more than two centuries ago and where Arendt equally hinted at (Berkowitz, 2010): in order to be able to speak (which is always some sort of a public act), one needs isolation and solitude required for thinking and writing, and the other way around, that is, in order to be able to write, one first has to have something to write about (such as the arguments raised in a seminar, or one's experiences when one is out in the field). Thoughtfulness (writing) and public action (speaking) are in other words two sides of the same coin: in order for one to establish, one first needs the other.

Originality: referring

Based on the scenes introduced above, by now it is perhaps already clear that the mode of existence of academic practice does not only pertain to being attached to the conduct of concrete research or to ascertaining the smooth progress of this research. A crucial and focal component, not only in the form of invested time herein but equally in the form of what one cares about and what one deems to be important – is equally to be found in the *education* one provides the students with. Important to know is that our two research centers are jointly providing a MSc program, centrally directed at and in tight connection with the research discipline. As the first scene denotes, for students this educational component is tightly connected to the person of the academic, but what are these

academics themselves attached to precisely in different educational settings? Again, a look at some scenes might offer some understanding:

> Scene 11. *The lecture hall is crammed with students. After having introduced a particular scholar and having elaborated upon his general thoughts, the lecturer elucidates some core elements of a text that is included in the course's reader. More particularly, and based on her preparation of the lecture on a couple of paper sheets, she clarifies to the students "how to read this scholar". During this argument, she relates back to other texts that the students already ought to read in view of previous lectures. "And that comes back to something we said before", the professor says. Or, "Remember also that particular author. In the case of that author we have seen … but for this author...".*
>
> Scene 12. *A reporter is present in today's lecture. He is going to give a guest lecture in view of the central theme of the course. On the front wall of the lecture hall, a slide show is again presenting a carrousel of pictures. There is no text; just a concatenation of one picture after the other. The journalist's central claim is that there is a huge gap between what mass media portray on the one hand, and what he calls "mass reality" on the other hand. His lecture largely consists of a reporting of his personal experiences, that he himself has directly experienced in the field.*
>
> Scene 13. *During a research methods workshop, the attending students are asked to form groups and discuss the methodology they (are going to) adopt in their own research, based on a couple of texts they were asked to read beforehand. In the group we are attending, the discussion is very scattered and goes from mere chattering to conceptual discussions about terms used in some of the texts (by leafing through the text, searching for connections, refering to other texts, etc.) and finally equally about how to eventually write a thesis oneself. One student remarks that "The academia amounts to playing with concepts and structures. It's all a game". The other students snigger. When the lecturer joins the group, the discussion immediately is a lot more focused. The lecturer strews suggestions to each of the different students: "That is great! I'll align you with a group of researchers who are exactly doing this"; "You could use author Z"; "Consider the spatial turn in the social sciences"; "Some very good fiction has been written about this"; etc.*

> Scene 14. *A student enters the office of a professor. They are having a meeting about her master's thesis. The student starts by reporting of the progress that she has made. This includes a literature review and a review of what appears in popular media about her research topic. She has one observation that she considers herself very remarkable. "And what does that mean?", the professor asks. "That the media have a Western perspective", the student responds. The professor interrupts her. "Watch out with your terminology, dear student", the professor says. "The terms you are using now suggest a severe breach between two things." He asks her to be careful with which concepts she deploys precisely, and adds that "Words are not neutral. You have to take a distance from the terms that media use, and deploy your own concepts instead".*

How does academic practice appear in scenes as the ones above? To start with, it is clear that the academic is a person who constantly and actively *refers*: to other authors, to texts, to broader movements, even to fiction. In order to make an argument, hence, the academic draws her own argument into a broader realm of other arguments, thereby making her own individual argument *weaker* (that is, no longer pertaining to her individual self) in order to make the claim *stronger* (that is, undergirded by other views and arguments). Latour (1987) has coined this mobilization of allies as being characteristic of the conduct of scientific research, but it seems as if this is, by no means, confided to research alone. Quite on the contrary, even students master this habit of referring very soon and conceive it as a "game" of which they have discovered some hidden rules (scene 13). This is not only to make the claim stronger however, but equally about what is deemed important (e.g. linking, connecting) and valuable (e.g. fiction), or what one thinks students could be helped with (e.g. another research group, a theory). Furthermore, these actions of constant referring make the academic come into being as someone who has something to say, that is, as somebody *original*: not only is she someone who is always able to frame, contextualize, relate, etc., it is precisely because she constantly refers to others and the work these other people are doing that she can make clear that she equally has something to state herself. That is, by constantly referring to other works, the originality of her own work increases. This differs from the (figure of the) journalist in scene 12, for instance: the journalist reports of his own experiences, based on his own research in the field. This is

where the journalist obtains his legitimacy from: from having been a witness of a certain thing at the moment of its occurrence. For the journalist, there is no value in relating to social theories or scholarly literature: what counts for him, is what happened in a particular setting. For academic practice, however, this is not enough: settings *need* to be related to such theories and literature – sometimes translated into one general term or concept, but especially in educational settings equally often provided as a whole (i.e., in the form of a text). By doing so, academic practice comes into being as a practice where nothing can be uttered non-committally and where one attaches oneself to texts, concepts and their proper use (not *any* concept or reference will do) in order to have something originally to contribute oneself. This equally applies to the students present here who are urged to attach themselves exactly likewise: to equally refer where necessary, to adopt the right concepts, to make the proper links between different theories and approaches, in other words: to be as specific as possible about what one refers to, in order to be able to say something of oneself. In doing so, textual matters, concepts and precision in using the right and proper texts and concepts, but equally the act of referring, constitute obligatory passage points in the establishment of academic practice: it is something that one has to attach oneself to in order to offer worthwhile education or a worthwhile presentation, in brief, to be able to speak for oneself, viz. *as* an original self. This implies an obligatory *commitment* with these texts and concepts: they need to be read and studied before one can say anything (of worth) at all. Overall, this fourth form of attachment is an attachment to such commitment: by and through committing oneself (to texts, concepts and proper use), the argument one is presenting is not only potentially original, it is equally rendered more *distant* (that is, more factual, more scientific). As we will argue in the next section, this distance is a central feature of the mode of existence of academic practice as a whole.

On the mode of existence of academic practice

It is crucial to note that these four portrayed forms of attachment (to generality and universality; to one's research and one's discipline; to spaces and times and to originality) and the related interplay that is a

result of these attachments (between particularity and generality; singularity and universality; depersonalization and repersonalization; collectivizing and reducing; thinking and speaking; originality and referring) that portray how academic practice comes into being as 'academic', have been presented here separately for the purposes of this analysis, but that in practice, they are not so easily discernible from each other. Rather, most of the time these four forms of attachment are at work *at once*. This analysis has tried to elaborate upon the many passionate interests at work in academic practice; interests, as we have mentioned, as that what one needs to pass through in order to go somewhere (Latour, 1999a; 2013). In that sense, these four attachments constitute the generic passage points in order to get something 'academically' done. By doing so, we have refrained from introducing any overarching or determining elements. Rather than that, we have opted for giving an account that is as flat as possible, that does not seek to explain anything (away) but that precisely tries to present how academic practice comes into being by means of and through these relational attachments.

Ultimately, then, what these four sorts of attachment have in common could be termed as a directedness at *distancing in action*, to converse Latour's claim that science in general is characterized by *action at a distance*. With this expression, Latour (1987) argues that the scientific mode of existence operates in such a way that it creates *centers* that are able to act at many other, distant, points. Think of a room in which a scientist is able to see the sun and the stars by means of projections generated by a telescope and rendered on a screen, for instance. The astronomer does not need to travel to the sun or the stars in order to make legitimate claims about these celestial bodies because the telescope enables to see them here, in this specific room in first instance, and to construct further operations in order for the telescope to look more precise in the safe confines of this computer-equipped room – that is, to act at a distance – in second instance. By continuous cycles of accumulation, eventually – as a result – knowledge about the observed parts of the sky is generated. To act (to gaze in space, to make notes, to collect facts as researcher) upon something (an object such as the sun) on a distance (in an observatory, and not in a space ship) is according to Latour one of the prime features by means of which science can be

characterized. But what about the university? Is such action at a distance what qualifies the academic practices we have aimed to characterize here? The answer is: partly, for this constitutes only a minor part of how academic practice comes into being. Indeed, at some points in time, such moments are at play: by constantly displaying carrousels of visualizations, for instance, distant features are projected in the setting one finds oneself in at that moment (a conference session, a lecture, etc.), that is, a profusion of distant elements is projected in such a way that several elements of the outside world are drawn into the conference room in order to make some general statements about them (according to the operations as described above). But conceptualizing this as 'action at a distance' does not quite capture what happens here fully: although *distance* as such indeed constitutes a focal point of attention for the academic mode of existence (equally manifest in isolating oneself from the corridor in order to think and write, for instance), it is not so much directed at the intention (or purpose) to act upon these distant actors. Rather, it could be stated that the academic mode of existence is in first instance to be qualified as a continuous striving for *distancing* as the central way of being here – or to phrase this otherwise, as the central form of attachment. With 'distancing', we point not only to the observation that something is distant. Rather than that, the term is deployed in order to stress that distancing constitutes an activity (hence: in action) on behalf of the academic, and this in two different respects. On the one hand, distancing points to the act of drawing various specific elements together, of actively mobilizing what is not present and thereby making it present, and that furthermore has as purpose to come to an understanding of what runs through such specificities. Second, distancing as an act that aims to slow things down and that seeks to suspend the daily course of activities.

First, then, distancing in the sense of mobilizing and making present that what is not there. This is one of the prime features of the academic mode, be it in lectures, meetings, seminars or another activity: the distant is constantly made *present*. By mobilizing various features of the outside world, that is, by *drawing various distant elements together in a setting*, the setting does not so much transform in a distant center that acts at a distance as it transforms into a *hub* that draws (links, refers to, etc.) various particularities and singularities together (to stress that this is an

active operation). The accumulation *of the particular* (stories, anecdotes, pictures, movies, etc.) *and the singular* (a book, a person) in other words makes that academic practice comes into being as a practice that has the potential to establish both generality and universality. As such, for academic practice the significance of distancing is not so much chiefly to be able to – potentially – return to the places in the field one is visualizing or making arguments about, but rather to accumulate the particular and the singular, in such a way that the particular and the singular start to operate as a *grid* of conceptualized processes and evolutions that can and need to be put over other particularities and singularities. This at once enables and requires the exploration and localization of *other* cases: by means of such grids, exploring and localizing the distant is at once facilitated and becomes a priority. The mobilization of specificities, which is effectuated by displaying of, narrating about, connecting and referring to the distant in action, constitutes the prime driver of the furthering of one's discipline. What is allowed to circulate in this academic regime, then, are not so much exclusively 'objective' facts but rather a continuous flow of specificities that enables to make general claims and universalizing statements pertaining to the discipline one is in.

Second, the mode of existence of academic practice can equally be qualified as a mode that continuously seeks to distance oneself from the daily course of activities, that is, that continuously strives to slow things down (cf. Latour, 2010b; Stengers, 2011). Academic practice would be way more efficient if this focus on the right and proper use of words and concepts would not be so abundantly present, if one would just quickly write a paper in between the effectuation of other scheduled activities and when one has some spare moments instead of blocking a whole week and isolating oneself in order to be able to think, and so on. The point here is of course that this slowing down of things is precisely what is characterizable of existing as an academic: one *needs* to use the proper words in order to make sense of what one is talking about; one *needs* to withdraw oneself in order to be able to think; one *needs* to read many different texts in order to be able to take an original position; and so on. The fast or the efficient way of doing things is then perhaps not the academic way of doing things but rather the managerial way of doing things: hopping from meeting to meeting; from activity to activity is

perhaps what constitutes a managerial mode of existence. Even though such aspects are of course present in this corridor, they are not what characterizes academic practice as academic, which is rather qualified by slowing things down and hence by distancing oneself from the daily manner of doing things. Even in a meeting, for instance, one constantly hears questions and utterances that are slowing things down ("What do you mean with..?"; "How does this relate to the discipline…?"; …). This is equally why purification and commitment are such profound attachments in academic practice: one wants to do justice to what one has seen; wants to ascertain that one states the right and proper things; that what happens 'out there' corresponds with what happens 'in here', not in the sense of having a one-on-one correspondence but precisely in the sense of whether it pertains to what one has seen. These are activities that are slowing things down, that need time and space, and that are in this very sense about distancing oneself from daily routines. There is probably a case to be made here that perhaps it is no coincidence that we were kindly asked to preferably not observe individual activities primarily performed through the computer: perhaps the computer is the place (or the space) *par excellence* where this slowness is not always to be found, that is, where one has to hop from activity to activity, without having the opportunity to create such distance. As such, being a witness to such fastness is perhaps truly intrusive, in the sense that this not only constitutes a hopping from one professional activity to the other (emailing, searching the internet, writing a paragraph, reading a note, …) but equally a hopping from one mode of existing to another (from an academic mode to a managerial mode, from a professional mode to a family mode or an amical mode, for instance). This is not to say that the computer is a device that only accelerates: in isolated space and time, probably it is a device that is effectively able of slowing things down. Since the purpose of isolation is precisely not having somebody other there, in this sense it makes very much sense that such activities are preferably not observed.

In sum, by scrutinizing how academic practices are being in the making on a day-to-day basis and by illustrating how academics are specifically attached to particular things, what emerges is not only a *specific way of existing* but equally a specific way of *becoming an academic* and equally, one could state, of *becoming a university*, rather than being one already (cf.

Barnett 2011; Fanghanel, 2012). In doing so, this chapter has equally made clear two additional things. First, the tendency to categorize university practice into different roles or functions perhaps too readily assumes that such categories are the focal points of interest that require theoretical and/or empirical scrutiny and analysis. Classical conceptualizations of the academics' task into research, teaching, and service, for instance, are perhaps not the most beneficial manner in order to come to grips with how academics and universities exist nowadays: focusing at differences between these activity domains potentially obfuscates precisely what all of these activities have in common, that is, the attachments through which academic practice come into existence (cf. Boyer, 1990; Waghid, 2002). Second, even though the current condition of the university is often largely perceived pessimistically, we would like to draw this chapter to a close on a positive note. What this analysis hopefully has made clear, is that academic practice not only constitutes a specific way of existing, but equally that this way of existing is – at least in daily practice – by no means completely usurped by other societal pressures. Of course, we could have produced an account focusing on what is often designated as 'bureaucratization' or 'marketization'. However, if one puts such overarching and (proclaimed) determinative structuring evolutions between brackets in observing the specific types of activities that are being conducted in these two research centers, it is clearly apparent that the university is (still) constituting a mode on/of its own, instead of being singularly determined by such evolutions.

GENERAL CONCLUSION

An inquiry into academic practice, of broad scope

A theoretical inquiry (into relations)

The purpose of this dissertation, at its moment of inception, was to give an actor-network account of contemporary university practices, inspired by the hypothesis (it would perhaps be more apt to designate it as an intuition) that digital devices are way more than mere neutral tools, but *do* something and – more significantly – *make us do* something as well. Actor-network theory (ANT), at that time, seemed to be the vantage point *par excellence*, allowing to take these devices seriously instead of only considering them as tools to make use of. Since I started this dissertation, ANT has become increasingly popular. Perhaps this popularity has to do with a contention that many educational researchers working from many different theoretical frameworks have, throughout the years, come to share: that educational research is traditionally not paying enough attention to the material dimensions of what one is investigating (Braidotti, 2013b; Gough, 2004; Pedersen, 2010). Perhaps it equally has something to do with a somewhat atypical style of writing that is so characteristic of (classical) ANT-studies: all of a sudden, educational researchers were provided with a style of writing that allowed them to 'just' follow the actors and to 'just' describe. This style of writing has since the beginning been accompanied by a specific set of words and concepts: actors, actants, actor-networks, translation, symmetry – to only name just a few – were enthusiastically adopted in order to describe what was investigated (Decuypere et al., 2011b). To state it somewhat provocatively, however, this enthusiasm has sometimes led to a putting of the cart before the horse: it seems as if we (that is, we as researchers) have come to the realization that *everything is an actor-network*, that *translation is everywhere*, that *everyone and everything is an actant*, and so on. The point here, however, it that *of course* everything is

an actor-network, for instance – if you cling to that particular framework. This is reminiscent of other approaches that were deemed to be applicable to all aspects of the educational research field. The most renowned theoretical example over the last decades is probably the approach of Foucault: all of a sudden, discourse, power and governmentality prevailed and were to be found everywhere. Although there is – let me be very clear on this point – nothing wrong as such with adopting an actor-network gaze, what I mean with putting the cart before the horse is that throughout the conduct of this dissertation, I became growingly aware of some sense of (personal) unease with using ANT only to designate that this or that concept is to be found in whatever one is investigating. Fenwick and Landri (2012), as we argued in the second chapter, put it in an excellent way when they argued for distinguishing between *showing* and *telling* (cf. Fenwick, 2010b; Tracy, 2010): saying that something is constructed out of actor-networks only amounts to stating the obvious when adopting an ANT framework. It is this too straightforward application of concepts that is probably one of the biggest reasons for my unease: if you use them too much (e.g. if you just *tell* that something is an 'actant' without concretely showing how it is active and relationally being made active), the agential force of these concepts shrinks very fast (giving way to what could be called conceptual inflation). Latour (e.g. 1999b) has pointed to this danger already quite soon, but has never put it so eloquently as in his last book, where he describes the first attempts of an (imaginary) anthropologist in conducting ANT-research (2013: 35):

> Although our anthropologist is rather proud of her discovery, her enthusiasm is tempered a bit by the fact that, while following the threads of the networks, she notices that she has lost in specificity what she has gained in freedom of movement. It is quite true that, thanks to the networks defined in this way, she really can wander around everywhere, using whatever vehicle she chooses, without regard to the domain boundaries that her informants want to impose on her in theory but which they cross in practice just as casually as she does. And yet, to her great confusion, as she studies segments from Law, Science, The Economy, or Religion she begins to feel that she is saying almost *the same thing* about all of them: namely, that they are "composed in a heterogeneous fashion of unexpected elements revealed by the investigation." To be sure, she is indeed moving, like her informants, from one surprise to another, but, somewhat to her surprise, this stops

> being surprising, in a way, as each element becomes surprising *in the same way*.

Throughout this dissertation, I hope not to have fallen prey to such conceptual pitfalls. This is probably something only the reader can judge this dissertation upon, but in any case I think it is safe to say that we have made all efforts to escape some sort of 'ANT determinism' that would content itself with telling the same thing over and over again, for instance that 'everything in the university is a heterogeneous network' or that 'material actors are decisive in the establishment of academic practices'. This not because the framework as such would not suffice, but rather because, as Law, Latour & Callon all made clear, one of ANT's central tenets is precisely to avoid the deployment of some kind of metalanguage, consisting of concepts that invoke some kind of explanation (in the form of a construction, an unmasked belief, etc.). Rather, and as we have mentioned throughout the chapters, for the researcher the challenge is to come to a flat infralanguage that does not impose such explanations but that does succeed in giving an account of the settings one has investigated (and that is, for that reason, always to a certain extent unique to the settings investigated).

This was one of the reasons to designate the research we have effectuated here generally as *sociomaterial* research, thereby trying to avoid adopting ANT as some general kind of metalanguage, but at the same time equally trying to stay true to its central premises. The term sociomateriality furthermore enables to stress that not only did we incorporate insights from ANT, but equally from other approaches that aim to take materiality and relationality into account (assemblage studies; socio-technical studies; etc.). Lastly, a motivation for adopting the notion of sociomateriality is that this notion is largely coined to a variety of *approaches* rather than to one single theoretical body – thereby hopefully conceptually making clear that the point of view we adopted was not directed at theoretical clarification and explanation (and rather at sociomaterial exploration, one could state). The umbrella term sociomaterial studies in this dissertation hence includes a variety of approaches that are focally directed at giving an account of how both the social and the material elements of a particular practice are relationally constituted. The common denominator of all of these approaches, as we

argued in the first two chapters, is this directedness at *relations* as they are in action or in the making, that is, at a relational point of view that conceives of educational research in a presentative rather than in a representative manner. Throughout the first two chapters, we developed this relational thinking theoretically. We tried to come to terms with this relational thinking in such a way that its central premises are taken truly by heart, and thereby hopefully avoiding the issues we outlined here shortly above. In doing so, we made a distinction between *settings* and *practices*, the former designating a (physical or non-physical) arrangement of interconnected entities; the latter pointing to the typicalities of such settings in terms of typical types and actions of objects that can be found in these settings, typical types and activities of academics and eventually typical sorts of enacted space and time. In the four empirical chapters that follow, we hope to have stayed true to this distinction.

Furthermore, the theoretical contribution of this dissertation comprises more than the introduction of a consequential sociomaterial viewpoint upon educational practices. As we elaborated in the second chapter, the approach of social topology (or sociotopology, as we sometimes phrased it) bears central resemblance with sociomaterial approaches. Albeit this sociotopological point of view has already been tied to a sociomaterial point of view, concrete applications of such tying are at present rather limited, and certainly in the educational field. Therefore, we first introduced this topological point of view, then elaborated upon this view and how it is related to these sociomaterial approaches, in order to finally outline how a combination of these two enables to concretely effectuate relational research. In the four chapters that followed, we conducted such relational research, thereby equally adopting specific research methodologies.

A methodological inquiry (into visualizations)

Hence, this dissertation equally had a methodological inquiry as focal point of interest. In order to adhere to the relational views as outlined above, we wanted to deploy a methodology that was congruent with these views in order to, one might say, practice what we preached (rather than merely theoretically advocating for a relational stance). In the first two empirical studies, this methodology proved to be the elaboration of

an interview technique that focuses on how academic practices are composed precisely, and this without focusing on 'experiences' and/or 'meaning giving'. This interview technique (as some sort of hearing) was developed in order to be able to come to network visualizations. These network visualizations were furthermore developed in tight connection with the sociomaterial and sociotopological approach to figures that we introduced in the second chapter. The concrete results hereof will be wrapped up in the next section, but overall, I think the methodological significance of this approach is quite novel with respect to such kinds of analysis. We hardly emphasized this in the chapters that preceded this conclusion, but a qualitative analysis of quantitatively shaped data that were qualitatively collected (the phrasing is quite clumsy, but there is no other way to say it than this) is not only an innovative approach with respect to the research effectuated in this dissertation, it equally offers another take at the traditional distinction between qualitative and quantitative methods. Of course, last decades have seen a growing tendency to stress the importance of mixed methods research, where a qualitative and a quantitative approach are combined in order to shed more fully light on the things one investigates. This, however, most of the time constitutes a *complementization* of the two domains, where the two of them are both recognized in their importance but nevertheless constitute a different approach (Yin, 2006; Johnson & Onwuegbuzie, 2004). I think that our deployment of network visualizations in a certain sense gets rid of such bifurcations: it is no longer about the one complementing the other, but rather that both of them are jointly deployed (and developed) in order to come to understanding and new insights. There is no way of (qualitatively) making sense of such networks without them having been shaped quantitatively, but equally and in first place there is no way to shape these networks without first having (qualitatively) observed and registered the actors and the relations populating such networks. In a sense, this goes beyond what the makers of the Gephi software envisaged what can be done with the network visualization software: as far as they conceive it, the software enables to qualitatively analyze quantitatively constructed networks out of quantitatively gathered data (mostly online) (for an example see Latour et al., 2012). To put it otherwise, if the visualization of networks is used in a different way than is done in social network analysis (that is, the network

as a blueprint structure portraying social life), the aim and scope are most of the time all-encompassing and overarching. There is a 'big data' argument to be made here, where the more information (about actors and relations) one gathers, the better one will be able to analyze the things one has visualized (for elaboration and a counterargument, see Venturini et al., 2014). Conversely, our approach to network visualizations emphasizes and has hopefully shown that there is nothing wrong with sticking to smallness, or stated otherwise, that a massive amount of data (and hence, a massive network) is perhaps not always needed. Indeed, the network visualizations we constructed do not have any ambition to make an overarching view on academic practice as it is constituted nowadays. Rather than that, the meticulously composed networks allow for seeing how relations play a role in the effectuation of concrete daily practices, and this without having to confine ourselves to digitally gathered (scraped/crawled) data. The advantages are shown in the first two empirical studies: they are able to shed a highly specific light on how academic practice is composed nowadays on a daily basis, and this on behalf of all activities conducted during a day (instead of only on the work that would be effectuated in front of a computer). The trade-off here is that designing networks likewise is extremely intensive in terms of time investment.

Returning to the topological argument now, I think sociotopology is a useful approach in order to let these networks speak, that is, to be able to make sense of these networks without having to revert to some kind of metalanguage. The concrete effectuation hereof is the subject of the next section, but for now I want to stress the notion of the diagram, as the place where the visual and the textual intersect. We introduced the notion of the diagram as a technique that enables to display relations and that brings the visual and the textual together in such a way that one writes about what one sees and that one sees what one is writing about. Such an interpretation is only possible if one refrains from a representational view that conceives of figures (as the visual elements that pertain to the diagram) as being merely mimetic pictures and instead conceives of these figures as descriptive objects in their own right, that is, as visualizations that in and on themselves already describe. The technicalities have been thoroughly argued in the second chapter, but what I want to stress here is the relation between presenting a visual

account and a written account – thereby equally including the sketches we made use of in the fifth chapter. As we argued, the diagram is a place where the visual (sketches; networks) and the articulable (the surrounding text) intersect, and this in such a way that it becomes possible to say something about educational *practices* (that is, about what would be specific about a particular educational, or in our case an academic, setting). I have to admit that perhaps this statement might, at that point (with no empirical elaboration) have sounded somewhat as a hat-trick, pulling the rabbit out of something that was once empty and void. But I hope that we have managed to convince the reader throughout the empirical chapters that followed that this was by no means a magic trick. If deployed conscientiously, that is, with the proper ocular (e.g. presenting instead of representing) and writing (e.g. infralanguage instead of explanatory language) techniques, what is typical about a(n academic) practice might eventually – through writing and displaying – emerge (e.g. specific types of academics, different actors that stand central, different sorts of enacted time and space, and so on – see next section). To start with, this implies that the adequate figures have to be deployed, and that these have to be combined with a proper text. It is this relation between text and visuals that is crucial, but at the same time the most difficult relation to establish. How to write an 'adequate' account of what is made visible through the visualizations? (That is, how to compose a diagram?) There is no unequivocal answer to be given to such questions. Rather than that, I think it is of crucial importance that these diagrams are able to stand on their own, that is, that there is no need for additional elaboration or explanation of the diagram one has composed. In my opinion, it is precisely this what Latour (2005a: 148) was pointing at when he enigmatically advanced that the writing of an adequate account 'is finished when it is done'. This applies to the diagram as well: a diagram is finished when it is done, that is, when one has composed a diagram in such a way that it is able to stand on its own, without any need of additional clarification or explanation. The central issue, then, is an issue pertaining to *adequacy*: how to compose an adequate diagram? In a certain sense, I think this is highly dependent upon the questions you want to answer if you have finally decided to venture into the field with these theoretical and methodological axioms as vantage point.

The question we posed ourselves in the third and fourth chapter, i.e., a question pertaining to the composition of academic work, was more aptly raised through network visualizations (and not the other way around, that is, that these visualizations would give the answer to this compositional question). The question of the fifth chapter was centrally directed at the choreography enacted by and through the presence of screens in academic practices. Such choreographic interest is perhaps more adequately scrutinized through sketching what one is investigating. This has to do with the adopted means of data collection: each question needs a different type of methodology. In order to scrutinize the agency of 'the screen', as the typical device that is associated with 'the digital', network visualizations would perhaps not have been especially useful: their central directedness is raising questions with respect to what we have called the distribution of the various actors present in that what one is investigating, rather than adopting a focus on one central actor (and the consequential operations and relations that this actor generates) per se. Furthermore, an ethnographic stay at two research centers allowed us to focus our attention at this screen, and at the operations the screen performs, by being present there ourselves. Bearing in mind both the pragmatics of the temporal intensity of constructing 'quali-quanti-qualitative' data and the simple ascertainment that the scope of our ethnography was of another nature than the scope of the ethnographic interviews, we opted for sketching as a visual research activity in the fifth chapter. Again, these sketches should not be considered as representative pictures: they were constructed during our stay at the two research centers in order to try to make sense of what was happening in different activities because of the presence of the screen. As such, equally the activity of sketching can be considered as a research activity itself, deployed in order to raise questions about what happens in a particular situation.

An empirical inquiry (into academic practice)

After having wrapped up the theoretical and the methodological inquiries performed, in this section I make some final conclusions about the empirical studies that form the core of this dissertation. In order to do so, I will group the four empirical studies into two groups of two,

since they originate from the same research phases/stages: first, the third and fourth chapter that give a rendering of the interviews with different professors and that made use of network visualizations; second, the fifth and sixth chapter that report of the ethnographic study we conducted.

The third and fourth chapter gave an overview of the composition of academic work at the level of what professors do on a daily basis. As stated, the purpose of these studies was not to come to an extensive overview of the contents of these activities or the meaning attributed to these activities. Rather than that, the stakes of these studies were situated at attempting to come to grips with what it is precisely that different actors (professors, digital devices, etc.) do in the effectuation of these activities. We started with an in-depth study of Mary's activities during the course of one day. Quickly, it became apparent that not only is there an enormous amount of actors necessary for academic practice to sustain itself and be effectuated (i.e., the constitution of academic practice), but equally that these actors distributed into regions that all have different operational effects and that some of these regions associated with each other through boundary actors or zones: (combinations of) actors that install flexibility into academic practice and that are thereby rendered authoritative. Furthermore, we presented three different profiles of academic practice, each time outlining a diagram of networks and surrounding texts (that described the form of these profiles as well as their implications). Each diagram, we argued, designates a *typical academic form*, and as such equally denotes typical elements of academic practice. Examples of such typical elements are the just mentioned boundary objects and zones (constituting interfaces) such as a browser, a word processor, PhD students (acting as gathering things); authoritative centers such as a printer or an e-mail inbox (rendered important by relating to them) different sorts of enacted space (e.g. plastic) and time (e.g. processing) and different types of academics themselves (e.g. constantly acting in a standby position; acting as circuit).
In addition, each diagram gave an account of the role of digital elements in academic practice. In this respect, we argued that it is not particularly useful to talk about 'the role of the digital' in academic practice. It could be stated that these studies show that talking about 'the digital' is fraught: the term is simply too large and too broad to act as investigatory concept. Rather, there can only be made fruitfully sense of the role of

'the digital' in academic practices in so far as one manages in showing concretely what *specific* digital actors such as an inbox, a word processor, a browser, etc., themselves concretely do by relating to other actors. This is a central contribution of these studies: they concretely show how such specific digital actors take up the form of a center through which one needs to pass in order to get a lot of things done; of an interface that gathers different academic activities and actors together; and so on. Additionally, these studies make clear that digital actors are not important in and on their own (as common sense often has it). Digital actors are only important in as far as other actors relate to them, and hence, only important (or authoritative) in as far as they are *being rendered* important.

Overall then, and summarizing, what these two chapters allow to see is, first, what is typical about the *composition* of academic work and, second, how academic work 'functions' on a daily basis. Put otherwise, what these two studies show is what is of importance in order to be able to do what one does in first instance, and the mechanisms that are at play in this doing in second instance. These analyses enable to map different academic practices in view of the relations that are established between different actors present (human, digital and analog the like) and at the level of the implications hereof on the sort of persons, time and space that are enacted likewise. The devil is in the details here: the more one succeeds in showing the specific relations between actors, the more one is able to trace the specific implications that are enacted likewise. These implications are crucial: these show the mechanisms by means of which academic practice is enacted. Relationally conceived, these mechanisms are never unidirectional but always have a double effect: a managing of the present at once leads to prefiguration of the future and hence to a fragmented timescape and a mosaic, functionally differentiated space; constellations of digital actors make things possible but at once equally stabilize activities into formats; installing the possibility to work anytime and anyplace at once implies that many actors need to be mobilized; and so on. In other words, in these studies we have shown in a very detailed manner what it is that different relations between actors do *precisely*, which has enabled us to come to additional understanding of what it is *precisely* that academic work consists of. Meticulously scrutinizing how academic practice is established nowadays, that is, how academic practice

comes into being, is crucial in order to know what we are talking about if we talk about 'the current condition of the university' (as the place where such academic activities are effectuated). In times where research on the university is largely focused at either structuring factors or at personal qualification, signification and meaning-giving, I think these studies make for an important contribution.

Despite all these advantages, there are however of course equally aspects that these studies do not – cannot – make visible. Meaning-giving and structuration would be two noteworthy candidates here, but since this dissertation does not revolve around these concepts, I am not going to steer the argument in that direction. Rather than that, what these visualizations are not quite able of making clear is what happens in academic practice from an *educational* point of view, that is, what (if anything) is precisely educational in academic practice. We should inform the readers here that half of the interviews were conducted during a class-free period, outside of the teaching semester, and that these two studies hence could not exclusively focus on educational aspects as such. But we equally designate something more: even if all academics would have reported of the lectures they gave, for instance, would these networks then have been able to qualify precisely what happens at an educational level? The answer is probably: partly. This approach of deploying network visualizations would have been very informative in terms of its potential to minutely present how something as a lecture takes shape. It would undoubtedly have shown how certain actors, such as a screen, a book, chalk, etc. are decisive with respect to the composition of a lecture: some would be of central importance and being heavily related to, others would constitute an interface between activities of lecturing and note-taking (perhaps the keyboard or the pen by means of which a student takes notes), etc. Whereas in our ethnographic research we did get acquainted with the practice of lecturing, the sketches adopted are by no means able to make an outline as detailed as these networks do. Hence, if network visualizations would have been adopted in these studies, we would have gotten a much more profound understanding on behalf of the different actors involved, and how these actors and the relations between them enact the very practice of lecturing. This was one of the motivations for the choice to focus our attention on the screen as such in the fifth chapter and on how this

screen (as an active actor) establishes relations with other actors: it is simply not possible to focus on all these relations at once when personally observing by means of note-taking. Even filming a lecture would not have solved this issue completely: cameras are only capable to capture what they are directed at.
Notwithstanding the advantages of these features, however, I think there equally is a case to be made that these network visualizations would not be able to fully capture what happens in, for instance, lectures from an educational point of view. This has to do with the fact that these networks are not able to qualify all that happens in educational activities. To be clear, the point I am making here is not a point pertaining to the qualification of the relations as such: as stated, we qualified each relation present in these networks, and this did assist us in 'reading' these networks in order to make sense of what we saw. Rather, what I am hinting at are questions that networks can probably never fully answer. How could these visualizations make visible moments at which something educational happens? How could they make clear that at some point in time students have learned something? These are questions of another nature; questions that are difficult to raise and answer when deploying network visualizations. Even though this might sound somewhat opaque right now, I will make this point more explicit after a brief roundup of the fifth and sixth chapter.

In contradistinction with the first two studies that were directed at giving an account of different academic forms, in the last two studies we adopted another approach. By means of an ethnographic stay at two research centers, the interest was again directed at how academic work is composed precisely, what the role of digital devices is precisely in this respect, and how to relate this to the current condition of the university. In other words, the general research interest was similar, but the approach differed and consisted, more specifically, of following academics during the conduct of their activities. The fifth chapter focused on the role of the screen in academic work, and is in that sense exclusively devoted to our interest in the role of digital devices in the effectuation of this work. In order to give an account that did justice both to the screen and to the humans present in the settings we observed, we opted to present our analysis as a choreography that focused on the sceneries of academic practice, the roles performed by

the screen and the script that ran through the settings we observed. Based on the sceneries of different practices, we first made a distinction between the more traditional point of view that one merely sits (or stands) behind a screen, and our observations that the screen is a device that inaugurates a *before*, and this with significant consequences for the other actors present in these settings. Then we presented the different roles that the screen performs in academic activities, and related these roles to common perceptions regarding the shreddedness of academic work: the screen can play many different roles, but only one role at a time, making that one often does many different activities after one another (first this, then this, then that). We ended the analysis with the script that runs through different academic practices, and more particularly with the argument that at certain points in time (in)compatibility between different activities is established, where digital devices and human actors are in tune or precisely out of sync.
The last study was devoted at the *academic mode of existence*, i.e. at the question whether or not there is something that might qualify an academic activity as 'academic'. In trying to come to an answer to this question, we deployed the notion of attachment (conceived as 'passionate interest') and gave an account of four types of attachments that we came to see during our stay: attachments to generality and universality (by purifying what one is talking about); to one's research and the discipline one belongs to (by authorizing both oneself and other persons); to specific sorts of spaces and times (by inhabiting common or precisely isolated spaces) and finally to originality (by referring to others). We argued furthermore that an academic mode of existence can more particularly be characterized by *distancing in action*, that is, by drawing things together and by slowing things down.

In sum, these latter two empirical studies complement the former two with respect to how academic practices can be investigated. Whereas the interview studies gave an in-depth overview of how academic practice is composed in order to come to an understanding of what the role of both social and material actors is in current academic work, the ethnographic studies were directed at coming to an understanding of what academic work itself is precisely by focusing on academics and equally on the prototypical actor associated with 'the digital' (the screen). Let me now return to the question of the 'educational'.

How to qualify something that happens as being 'educational'? The question itself is highly contested and not easily answered. Is what happens in a lecture hall per definition educational if and when students have acquired some knowledge about a topic? Is it equally about socialization? Can a meeting between two academics be educational, or is a meeting only about professional activities? The question, hence, is first of all a question pertaining to how one defines the term 'educational' itself. A plethora of work has been conducted regarding this specific issue, and of course in this conclusion I do not have the time to elaborate upon all of this (see Masschelein & Simons, 2013; 2015 for overviews). Rather than that, I will limit the argument to what could be termed as an educational *activity*, and which I designate here in a sociomaterial vein as 'turning objects into things'. In this respect, something can be designated as an educational activity in as far as somebody (a lecturer, a teacher, an academic, …), first, makes something public in a particular setting (a lecture hall, an office, …) and second, in as far as that what is being made public is not presented in a factual manner but precisely as an entanglement that one cares for and that is presented in such a way that it becomes a common matter of concern. The notion of 'thing' here, then, has the same *general* meaning as it had in the previous chapters, that is, as a gathering of a variety of actors. What is at stake in educational activities, however, is not only this general act of gathering or assembling, but equally a *specific* activity of making this gathering public, that is, to *present* it 'to the eyes and ears' of those assembled (for instance in a lecture hall) (Latour, 2005b: 8; also Simons & Masschelein, 2009). Furthermore, such an educational activity is always established in order to bring about some changes in those who are assembled (in a university setting, the students): to make them learn particular things. I am not only referring here to learning as idiosyncratic *knowledge acquisition*. Rather than that, I equally adopt the term to refer to *learning to think* and to *learning to deal with objects of concern*. In that sense, the term learning is perhaps an ambivalent one, since it is equally heavily used in arguments that equate what happens in an educational setting merely with individual knowledge gain (thereby sticking to the first meaning of the word). I do wish to stick to this broad conception of the concept (and its three dimensions), however, since it equally has the nice connotation of 'becoming acquainted with', that is, to become

acquainted with a matter of (common) concern.

In conceiving of educational activities likewise, I make a triple move: inspired by my own observations during my ethnographic stay, I first advance that educational activities are always committed activities and directed at 'doing right', and this both to the matters one introduces and to the students one addresses. Second, I state that an educational activity constitutes a *critical* act (it gathers various actors and is about 'matters of care'; see chapter 1) and, third, make the connection with the interview studies, that deliberately conceptualize boundary actors and zones as things. In designating what is boundary as a thing, we made a case for conceiving of actors (or combinations of actors) as having an associating capacity: they bring academic practice into union. This, however, only pertains to the *general* notion of 'thing', i.e. the activity of gathering, and how this gathering is effectuated by PhD students, paper sheets, colleagues, software programs, and so on. However, what these networks cannot portray is the *specific* interpretation of this notion of 'thing', that is, this activity of presentation (in the strong sense of the word: making something *present*) and what this making present does to those assembled. As helpful as these analyses are in the respects we outlined above, they are probably not very well-suited for giving an account of how a thing in this specific sense might emerge. Put otherwise, *if deployed as the sole research technique*, these networks are probably not very well-suited for tracing educational activities.

I am pretty sure that the larger part of the people involved in the construction and (visual) interpretation of these networks would disagree with me on this part. They would probably retort that networks are very much able to present how some-thing becomes a thing, equally in this specific sense: in as far as more people relate to something (through the establishment of hyperlinks, for instance) they would say that a 'matter of fact' transforms into a 'matter or concern', an issue, a thing. The argument they would probably make would thus be centered around the *magnitude* of the total sum of connections that people make regarding a particular subject (e.g. a decision of a minister to cut costs in higher education might be published online on a newspaper website; some opinions might be published thereafter; many people might start blogging, twittering or facebooking about the decision; etc.). Even though the establishment of such connections shows *that* people are

attaching themselves to what they deem of importance (e.g. a good quality of higher education and not only in view of economical logics; the university as an institution; …), these networks cannot give an account of *what this attaching does to these people*. It is here that the fifth and sixth chapter ask for an additional important contribution, and why I have stated above that in order to be able to present such educational activities, one needs to have been there in order to see how this attaching comes about in practice (not only *that* academics refer a lot, for instance, but that they do this precisely in order to have a voice of one's own), before one can actually fully apprehend what such actions of attaching themselves do (how these different sorts of attachments make that something as an academic mode of existing come into being, for instance).

In a certain sense, we bump to the limits of network visualizations here: they are perhaps not so well suited for tracing educational activities, because they are primarily directed at presenting sociomaterial relations. That is to say, and to sharpen the distinction somewhat, the central interest of sociomaterial approaches is a *social* concern, not an educational one: they are an apt technique to present how and that something is rendered public, but perhaps not so well suited to account for what such activities make the ones assembled do (such as learning to think, learning to deal with matters of common concern, etc.). This is probably why sociomaterial approaches that make use of network visualizations are not fully fit for showing how one acquires knowledge, learns to think about or to deal with objects of common concern if they are the sole research technique adopted. They might give a very precise overview of which actors are of central importance, of what is necessary in order to make something present, of which things people attach themselves to and even of the way in which these people position themselves towards these things. All this would give insight in what are important actors in the settings one investigates, and more significantly, which relations are of central importance in order to make something present (on behalf of the lecturer), and even in order to learn (on behalf of the student). This would offer the researcher the opportunity to look differently at that what she is investigating: some elements might not be thought of before, some relations might appear more important than one thought, etc. In this sense, if one is centrally interested in investigating

educational activities, network visualizations form a good first step: they can be deployed in order to see what is of importance to make something present, defamiliarize what one is investigating and assist in adopting another way of looking. But a concrete account of what this making present or this attaching concretely does, that is, of how an educational activity and learning come about, would require a second step that would entail to investigate what such actions of attaching and making something present do with those who learn.

This is then not to say, however, that this dissertation does not give any account of such educational activities. Even though this was not the specific focus of our ethnographic studies, I think that – in retrospect – a sociomaterial ethnography might actually be able to make such educational activities explicit, precisely because in such research designs one is physically present and one can hence make an analysis about what and how people learn through such activities. What, then, are such educational activities? Which activities turn objects into things in academic practice? In retrospect, I think that the script as we presented it in the fifth chapter might constitute an overview of such educational activities. The activities that were presented there, that is, activities that took place on moments at which compatibility or incompatibility between different actors was established all have something in common: these are all activities that created a public by gathering this public around something that was made present and, thereby, made common. The role of the screen is not to be underestimated here: it takes effort to establish a relation with the screen in such a way that it does not act as a device that *hinders* that a public, and something common, might come into being. An instance hereof is when the screen starts to operate as an individually absorbing device: on such moments, there is nothing more than a (private) one-to-one relationship with one singular viewer and the screen. At all other moments, however, and these are moments that include as well as exclude a screen, it could be stated that a public is gathered around a thing that is made present. This might be effectuated by giving the screen the central position or precisely by competing with the screen in order to exclusively draw the attention to one's own voice. Another example is the setting of the seminar we described, where one was to such an extent engaged in a discussion about some-thing, and seeking ways so as to think and learn to deal with this thing, that the

screen was simply forgotten. Equally letting the screen display something just for the sake of displaying something is in that sense a significant educational activity: it enables the sustainment of that what is common, for instance a presentation at a conference for 30 colleagues or a lecture for 200 students. Furthermore, letting a screen display a definition for instance, could be designated as being an educational activity, not only in the sense that this definition is turned into an object of common concern, but equally in the sense that the students were urged to think about (and with) this definition and deal with this definition as an object of common concern. In addition, in the sixth chapter it again became apparent that the screen plays a crucial role in the establishment of educational activities. Their capacity to display a profusion of illustrations, for instance, is an activity of drawing the world within: by gathering different particularities and displaying them, various objects (pictures) are gathered there and turned into a thing, that is, the subject of the conference presentation is rendered common, and hence *presented* as something of which the ones assembled have to learn some things about in the three senses as outlined above.

All this is of course not to say that the screen equally performs operations with converse effects and that have more of a privatizing character, such as (as just mentioned) when students are so absorbed by their own screen that they do not seem to realize that they are still in a lecture hall. Such aspects were hardly mentioned in this dissertation, and for good reason: we did not want to engage in a discussion with respect to whether screens constitute something to cherish or abolish in the university nowadays. They are present and will probably never disappear. In that respect, then, it is perhaps a better option to seek for ways so as to learn to live with these screens (in all aspects of the expression – Verbeek, 2011). Conceived likewise, this dissertation might perhaps not offer concrete handles so as to do this, but at the very least contributes to our understanding regarding the operations that render an educational activity (and learning) possible and which not.

The question of relevance, and the relevant question

In this section, I want to make a case for the relevance of this dissertation, and this beyond both its topicality and its broad scope. In

order to do so, I make a distinction between two different sorts of relevance and, based on this distinction, argue that the question of relevance is by and on itself maybe not relevant *enough*.

Practical relevance

This first conception of relevance is nowadays probably the most prevalent one. In its most simple form, this is a question pertaining to its direct translatability to the educational field: Can one's research be concretely applied to the professional field? There is some sort of normativity implied in this seemingly neutral question, that is, the conviction that the easier something can be applied, the more relevant (and hence, of more worth) it is deemed to be (Biesta, 2007). Although there is of course nothing wrong with such applicatory potential, I do think it is a dangerous question in the sense that it obfuscates not only the research one has conducted or the results one has obtained, but equally in the sense that it obfuscates 'the professional field' itself. That is to say, although it is of course possible to contribute to this field, the applicatory question (which amounts to the question *What can we* do *with the fruits of your efforts*) tends to diminish what is being done in the professional field itself: 'the professional field' is then considered as something where one merely does things and where what can be done with these fruits is predetermined. I do not really believe in such a view, since it tends to treat 'the' field as a uniform whole, that is, as an amalgamation of professionals that nevertheless all have the same needs, desires, and so on. Conceived through such a lens, I think this dissertation has very few relevance. There is a very good reason for this, namely that the empirical investigations presented here are so specific and so minutely focused on particular relations, that some sort of direct transfer would not only do no justice to 'the professional field', but equally not to this dissertation.

Theoretical relevance

The second conception of relevance pertains to how one's research fits into a particular theoretical field, how one's research might offer some new theoretical points of view and how other theories might fruitfully

yield some insights about what one has theoretically elaborated upon. In its most simple form, the question of theoretical relevance amounts to whether or not one has done something other theoretical points of view can do something with. Again, however, I suspect that on such a plane the relevance of this dissertation is rather limited, in the sense that we did not offer concrete guidelines or axioms here so as to translate the points of view generated in this work into one's own theoretical frameworks. Furthermore, such a view again tends to comprise the 'whole' of a field – this time, the theoretical one. In designating what we have done in this dissertation as an approach, I suspect that in a traditional point of view, this dissertation did not contribute a lot. That is to say, if one conceives of theories as frameworks striving to provide an explanation of what happens in different educational settings nowadays, I think that this dissertation has probably, again, limited relevance. This dissertation did not explain anything as such, nor did it provide an applicatory framework.

The relevant question

The prime reason for putting aside such ideas of relevance is situated in the first chapter, where we distinguished between representational and relational thinking. The question of relevance is a question that is situated in the former: both on a theoretical as well as on a practical level, the question of relevance pertains to the assumption of valid and reliable findings of an educational reality as it (really) is. Put otherwise, the question about relevance assumes a correspondence (a veracious reflecting) of one's (theoretical and/or empirical) findings with an outside reality (cf. the two-collector system as outlined in chapter one). The question of relevance is thus a question that urges to be directly and actually applicatory to the (theoretical and/or practical) field. In a relational vein, however, we argued in the first chapter that relational research is first of all a matter of presentation and of intervention. As Osberg and colleagues (2008: 215) have stated, in a non-representational vein:

> [K]nowledge is about finding more and more complex and creative ways of interacting with our reality. Through doing this – through intervening in our own realities – we find out how to create more complex realities with which we can interact in yet more complex and creative ways.

Conceived likewise, the relevant question then is not so much about direct relevance as it is about potential intervention, not so much about direct application as it is about potential reconfiguration, and becomes: *Has this dissertation the potential to intervene in current states of affairs*?

First, rather than providing explanations or establishing a new theoretical framework, in a certain sense it could be stated that this dissertation has been atheoretical – that is, if 'theory' is used in order to invoke explanation. There are no explanations given here. What this dissertation does make possible, however, is a new way to conceive of educational practices in general and of academic practices in particular: by tying a sociotopological to a sociomaterial way of looking, for instance, this dissertation has the potential to conceive differently about how to approach educational practices. This dissertation then has the potential to intervene in as far as it has experimented with new ways of looking at educational practices and with how to present them, in as far as such experimental endeavors might disrupt established ways of looking at these practices and additionally offer another way of looking at these practices. In that sense, and second, this dissertation equally has the potential to intervene in the sense that it has tried to render something most of the readers of this work are very familiar with as defamiliar. This is then not a potential related to what can be concretely done with this dissertation (i.e., how it could be concretely applied), but rather a potential that pertains to the whether or not this dissertation intervenes in how we traditionally conceive of these matters that we often unreflexively denote as 'the university' or as 'academics': does it offer new ways to conceive of the university? Does it enable a new way of approaching what we qualify as academic or the person of the academic? At the very least, I hope these six chapters enact some new ideas; enable to look differently at 'the current condition of the university', 'the academics' that inhabit this university and the role of 'the digital' herein; and that they perhaps might on their turn enable to generate new ideas and interrupt more established ways of approaching the university. If I

have even only minimally succeeded on this behalf, I think this dissertation has contributed to intervening in how we traditionally approach the university and/or its academics.

The end

In this ultimate section, and rather than merely suggesting some directions for further research, I draw this dissertation to a close with some experimental propositions that move beyond this dissertation and that could inform an additional way of adopting a critical and relational point of view. These propositions are directed at how to implement such relational points of view in the university, and hence in academic education and research at once. This could be conceived as propositions that aim to establish in a relational manner what in a certain sense has always been the central endeavor of the university: to gather a public around a thing and make it present (an educational activity) and to consider this thing not as given but investigate it (a research activity) (von Humboldt, 1810). More specifically, the propositions I will shortly outline here consist of research and education as being two entwined activities, that have much to do with each other, but that are nevertheless not the same.

Traditionally, there have been many analyses that conceptualize this relation between education and research: Should research about education be educational itself? Does education in a sense always entails an investigatory component? How to conceive of this relation? Although these questions are interesting in and on themselves, I will not deal with them here. Rather, I invoke another distinction, that is, a distinction between the researcher on the one hand, and the educator (Dutch "pedagoog"; Latin "Paedagogus") on the other. Even though in what follows it will be clear that this distinction is not as crude as it might seem at first sight, I argue here that *the educator is not a researcher*, and conversely, *that the researcher is not an educator*. This is of course not to say that these two figures might be present in one and the same person; for instance, that an educator could/should not be in possession of an inquisitive stance, or that a researcher could/should not be in possession of pedagogical qualities. It is rather to say that the two activities that can be associated with these two figures, that is, an inquisitive activity that is

directed at understanding what happens in a certain educational setting *is not the same* as an activity that is centrally directed at making students learn certain things. In that sense, this last activity could be more precisely designated as an activity that is directed at composing educational practices in view of the students in the university (but of course always specifically centered around making something present). Hence, these two might be present in one and the same setting, but they are not the same since we speak about two different sorts of compositions here: the composition of adequate accounts (which is a research activity) and the composition of an educational practice (which is an educational activity).

In order to offer some final propositions, I would like to advance the term 'educational research' as the attempt to bring these two activities, and hence these two sorts of composition, in tune with each other (to invoke a term used in the fifth chapter). Rather than placing the two activities of researching and educating exclusively in the person of the educator, the propositions should be conceived in terms of an attempt to bring the two *activities* of researching and educating together in one and the same setting. After all, it is in this double sense of 'composing' that the position of the student herself is situated: at least in the university, the student is the one at whom the activity of educating is directed; but at the same time the student is equally the one that should eventually be able to conduct the activity of researching herself. It is here, in this coming together of these two activities, that the notion of 'learning' (in the threefold meaning of the word as argued above) comes into play: how to bring research and education together in such a way that the student is able to learn (that is, not only able to gain knowledge but equally able to think and act around an object of concern)? Is there a way to bring these two activities closer in the university, that is, to bring the research component more into our educational settings in order for students to be able to learn likewise? This is, by no means, a new question, but I think it is an especially important one nowadays, in times where the activity of educating is often only deemed worthwhile in so far as it exclusively contributes to the first dimension of learning (knowledge acquisition).

How would this look like? How to bring these two activities together? I can give no final answers here. I just want to propose some tentative lines that could bring these two sorts of composition 'in tune'.

- First, rendering sociomaterial approaches educational would imply that emphasis is put on the notion of 'gathering'. Gathering in an educational context, as we argued, revolves around presenting something to the eyes and the ears of those assembled. But who and what is assembled precisely? In a sociomaterial vein, what should be gathered is first of all that what one is present for, and this is then never 'given' as such, but rather a matter of care: something that one cares about and something that one wishes to understand (and that one wants to provide with an adequate account). Global warming, educational attainment, quantum physics or the French language: it does not matter, except to those for whom it matters.

- Second, in and through this process of gathering, different types of actors start to emerge: lecturers (who are concerned with composing an educational practice) and students (to whom this composing is directed and who are there to learn something), around a matter of care. This would imply that things have (re-)entered the university: there is no way to care without there being present something to care for and something one is concerned about.

- Third, such an understanding implies that we at least partly return to what was, at the very inception of the university, denoted as an *universitas*: an association of academics, students and something that matters.

- Fourth, in such an universitas, there is no predefined answer or a predefined closure. Rather than that, being gathered around a matter of care implies that one needs to learn about this matter in order to be able to understand how this matter is situated in a larger relational setting, and how these relations make that this matter comes into being *as* this matter. This constitutes an activity of researching: slowly seeking to compose (in the first sense of the word) an adequate account of what one aims to understand. Since this is

something all actors present are related to, this implies that in this respect there is no difference anymore between the lecturer and her students: *in this activity*, they are just caring actors entangled with a matter of care.

- Fifth, this composing, as a (research) activity of assembling (or mapping), will enable the universitas to discern the variety of attachments that are related to this matter of concern.

- Sixth, these attachments are to be valued and judged upon. Which attachments make that the matter of care is sustained, and perhaps sometimes equally: which attachments make it damaged? This is a crucial move, I think, and its success is completely dependent on the previous propositions. If the previous propositions are not rigorously effectuated, this valuation and judging will always fail (it would become arbitrary instead of committed). As far as this step forces to take a position (as an association), it equally forces to recompose the matter one is assembled around: which attachments need to be strengthened? Which need to be broken? Again, I think this is an activity that requires learning in the triple sense: one cannot abandon one's own position, come to the fore, and speak on behalf of the matter of care without having gained knowledge about, thought about and having learned to deal with this matter. Eventually, this leads to composition in the second sense of the word and hence equally constitutes an educational activity (whose finality is directed at the students): seeking for ways so as to (re)compose a practice oneself, discerning these attachments that save from those who kill, and finally potentially coming out as an universitas.

- Finally, this potential coming out is some sort of public service in the traditional meaning of the word: it is a potential intervention in the current state of affairs, established by the universitas and could be conceived as a committed speaking, on behalf of the universitas and for the matter at hand.

These propositions are by no means comprehensive and should be reworked (and definitely refined). If the reader should return now to the first chapter, she would probably say that these propositions are an attempt at critical creativity. I would not hesitate to reply that she is completely right.

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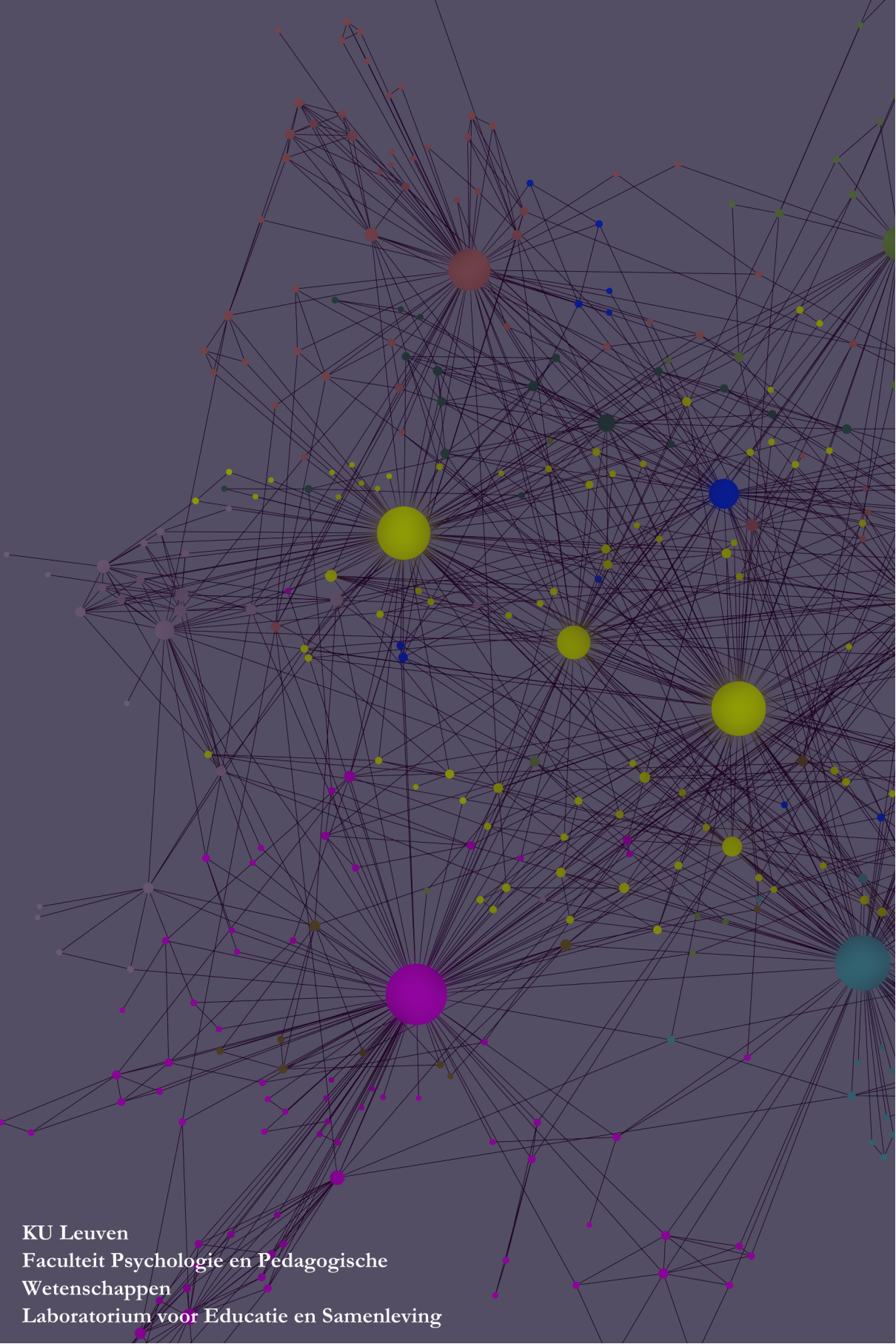

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